



FRIDAY, JULY 12.

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## Contributions.

## Rule 108 of the Standard Code.

ATLANTA, Ga., June 28, 1889.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Another point in the Standard Code that needs attention is the rule concerning disabled trains. Rule 108 reads: "A train overtaking another train of the same or superior class disabled so that it cannot move will run around it, assuming the rights and taking the orders of the disabled train, to the next telegraph office which is open, where it will report to the superintendent. The disabled train will assume the rights of the last train passing it till the next telegraph office is reached." Plain enough, certainly! Now picture to yourself a passenger train (No. 1) disabled on a side track at a non-telegraph office, so it cannot move, nor exchange engines with a following freight (No. 11.) No. 11 exchanges orders assumes rights of No. 1 and proceeds as No. 1 to the next open telegraph office. Another passenger train (No. 3) passes, but, of course, does not exchange orders with or assumes the right of No. 1 (now representing No. 11.) No. 3 does not even stop.

Shortly after this No. 11 (the original No. 1) is ready to move. What schedule does it represent to the next open telegraph office?

The rule says "assuming the rights of the last train passing it." The last train passing is No. 3, but it certainly cannot assume the rights of No. 3, as that train has passed; it carried no signal, and, in fact, did not necessarily know that it had passed No. 11. Doubtless, the intention is that the disabled train is to assume the rights of the last train with which it exchanged orders, but that meaning is not conveyed by the wording of the rule.

MASTER OF TRAINS.

## The Movable Frog.

JUNE 19, 1889

TO THE EDITOR OF THE RAILROAD GAZETTE:

The Wuerpel & Taussig frog comes up in your paper, of June 14 as a novel and a new discovery, but if you will investigate the Western & Atlantic road, 140 miles long, running from Chattanooga, Tenn., to Atlanta, Ga., and which is owned by the State of Georgia and leased to Governor Brown and his associates, you will find that the roadmaster of that road, Mr. Dooley, put that sort of a frog in use more than ten years ago. Any person who expects to work up a large profit out of a patent on such a device as that will find that Mr. Dooley settled the question long ago. On the Western & Atlantic road there are scarcely any frogs.

G. M.

[We do not see anywhere in the description of the Wuerpel & Taussig frog any statement or suggestion that it is either the first, the only or the best movable frog ever designed. It is, however, an example of such a frog which has had a good deal of hard use and has done its duty well, and was not illustrated in the interest of the patentee, but for the information of G. M. and the rest of the world. Another one still is shown in this issue. Perhaps G. M. will find some minor points of merit in that one. The power of the human mind to resist knowledge is great, but we can all learn if we try to.—EDITOR RAILROAD GAZETTE.]

## Locomotive Tests.

BY H. G. MANNING.

The tables and indicator diagrams accompanying this report are the result of a series of tests made upon the 8-wheeled passenger locomotive No. 88, of the Central Vermont Railroad.

The tests were undertaken by the Eames Vacuum Co., to determine the running conditions of the American type of locomotive, pulling its regular train and worked as it is daily, without any attempt to make an extraordinary showing. The prime objects sought were the weights of the water and coal used and the indicated horse-power developed. The testing apparatus used consisted of

two improved Tabor steam engine indicators, for obtaining the power exerted in the cylinders, one indicator for each side of the engine; a steam gauge placed at the front end of the engine for convenience in noting the boiler pressure; an indicating rod attached to the reach rod, running to and moving on the steam chest cover, showing the notch in which the reversing lever was held in the quadrant; a glass gauge on the side and in the centre of area (lengthways) of the tank, to show the number of inches of water fed to the boiler; suitable levers attached to cross-head for reducing its motion to that of the indicator. The general arrangement of this apparatus is shown in the figure. A suitable guard was built around the front end of the engine, to protect the operators from the wind, and for convenience and safety while operating the indicators. The same engineer and fireman were employed during all the tests.

The engine pulled train No. 53 on Sept. 3, 5 and 7 from St. Albans to Windsor, and train No. 66 from Windsor back to White River Junction. On the 12th and 14th train No. 57 was pulled from St. Albans to Windsor, and train No. 62 from Windsor to White River Junction. Train No. 66 was taken from White River Junction to St. Albans on the 4th, 6th, 8th, 13th and 15th. The engine remains over night at St. Albans and White River Junction alternately, and the route from St. Albans to Windsor and back to White River Junction makes a run of 150 miles one day and 190 miles the next from White River Junction to St. Albans. The number of cars hauled varied from day to day, and during each run, but the average train consisted of 7 cars. The indicated power shows clearly the work required better than the mere statement of so many cars, as the power required to pull equal trains or trains containing the same number of

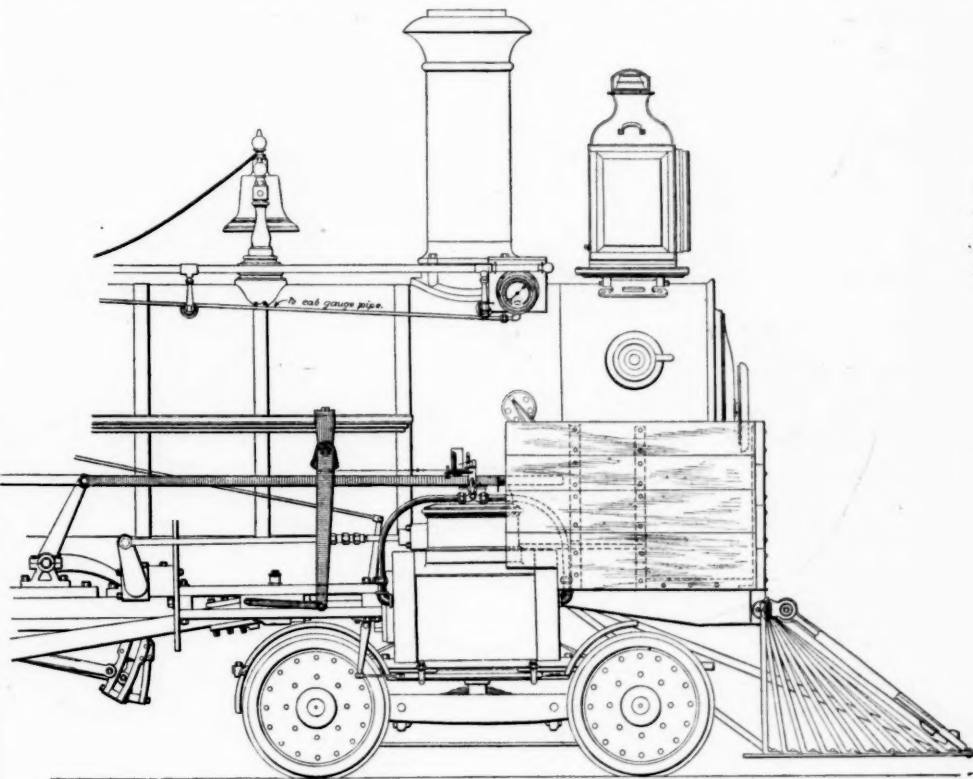
route as to prevent the fair average horse-power being determined.

The nearest average diagrams of each day's run are herewith presented. Where two diagrams are shown for the day's test, the average diagram for that day would have been between those shown, or, in other words, the average would have been made while the reversing lever was held between two notches in the quadrant. These diagrams show clearly the work the engine has to do, and the manner in which the steam is used by the engineer.

All the diagrams show the effect of a small throttle opening, and the initial pressure in the cylinder would have been higher if more opening had been given. Some of the diagrams, as, for example, No. 7, show a seemingly excessive compression for a locomotive, but had the initial pressure been nearer the boiler pressures this compression would not have shown so prominently as it does, and the diagrams would have had an appearance more like No. 3, which shows an excellent steam distribution for a link motion at a short cut-off.

Disabling of the indicating apparatus on the 13th prevented diagrams being taken during a portion of the route, but during the remainder the weights of water and coal used were obtained, and the power developed computed from these. The high power exerted was due to 11 cars having been pulled over 25 miles of the route, during which time nearly 700 horse-power was developed.

**Boiler Test.**—The coal used during the tests all came from the Reynoldsville regions, and, with the exception of that used on the 15th, all came from the same mine. Some further differences existed in regard to the manner in which the coals were transported from the mine, and these differences are clearly stated over each day's test in Table No. 2.



Indicating Apparatus.

## TESTS OF LOCOMOTIVE No. 88, CENTRAL VERMONT RAILROAD.

By H. G. MANNING, C. E., September, 1888.

cars, varies widely, owing to the changes in weather, train resistance and many other causes. The route is over a hilly country, ascending from either end to a summit nearly in the centre and descending to the end.

Table No. 1 gives the principal dimensions of locomotive No. 88; Table No. 2 gives the results of the tests in detail. The indicating apparatus used is shown in the figure.

**Engine Test.**—In making the engine or cylinder test, indicator diagrams were taken from both cylinders at the same instant by operators on each side of the engine. On the 3d to the 8th inclusive, diagrams were taken as above, but on the 12th, 13th, 14th and 15th but one cylinder was indicated, the results of the week previous showing that the right hand cylinder developed 98 per cent. of that of the left hand. Diagrams were taken as often as the two operators could conveniently work together, and the intervals between indicating never exceeded 2 minutes, and cards were often taken as frequently as once a minute.

Trains Nos. 53, 66 and 62 were accommodation, and No. 57 express, and number of stops varied from day to day, so that frequent diagrams were necessary in order to fairly determine the average horse-power developed. The diagrams were taken without reference to whether the engine was just starting the train or was at full speed. The gauge at the front end and other apparatus, referred to above, allowed the operator on the right hand side to note all necessary data pertaining to indicating. All observations were taken with the care that such tests demand. The absence of indicator data on the 3d, 4th and 18th is due to disabling of the indicating apparatus at such portions of the

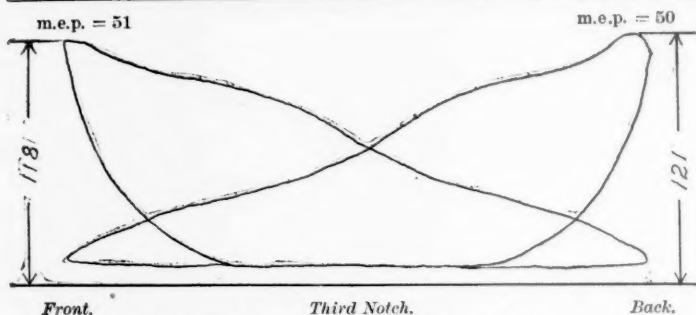
The coal used on 3d, 4th and 12th had been heated in the pile, and was partially slacked. This coal, therefore, was not expected to make the showing that an unslacked coal would, and just how much effect the heating had on the efficiency is readily seen by comparison with the other tests in Table No. 2. All coal was carefully weighed before being placed on the tender, and that which remained after the day's run was weighed back and deducted from the total amount put on. The fire was hauled at the end of each day's test, and rebuilt for the next run. Care was taken that the conditions should be as nearly alike as possible at the beginning and end of each trip.

The weight of water fed was determined by observing the number of inches in height taken from the tank, the weight of an inch having been determined by placing the tender free from the engine on the scales and drawing off successive inches, noting the decrease in weight. This weight agreed very closely with that calculated from the area of the tank, and has been taken as 545 lbs. per inch of height.

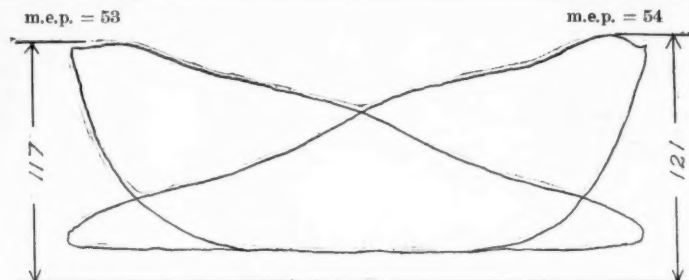
The boiler was fed by two Hancock inspirators. The duration of the test has been taken at the time the throttle valve was open and the engine was using steam.

The tests of the 3d and 4th have been combined with those of the 5th and 6th, it having been found inconvenient to separate the weights of coal used on each day.

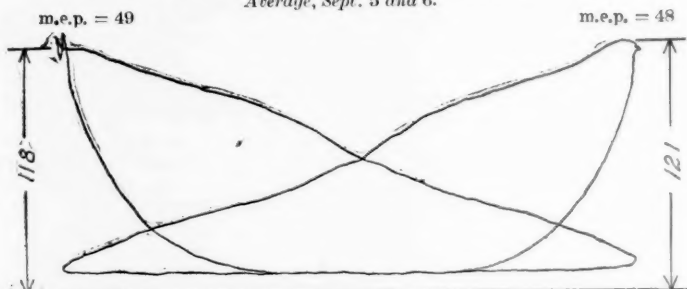
By comparison of the several days' tests it will be noticed that the most favorable results were obtained on the 7th, when 6.62 lbs. of water were evaporated to 1 lb. of coal used, and 8.49 lbs. of coal per indicated horse-power per hour, but it will also be observed that the indicated horse-power was



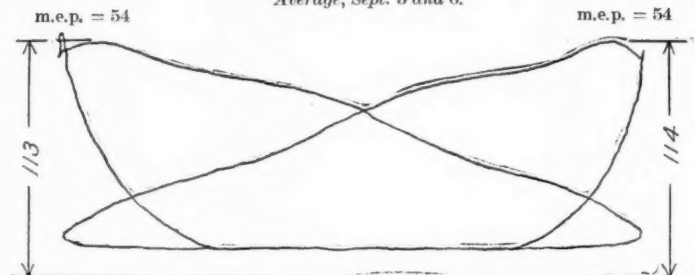
No. 1—Boiler pressure, 161; revs. per min., 164.  
Average, Sept. 5 and 6.



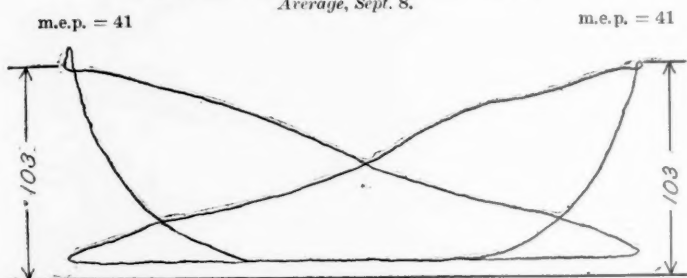
No. 2—Boiler pressure, 142; revs. per min., 184.  
Average, Sept. 5 and 6.



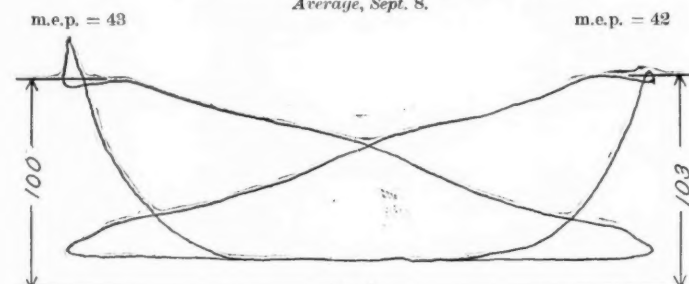
No. 4—Boiler pressure, 139; revs. per min., 176.  
Average, Sept. 8.



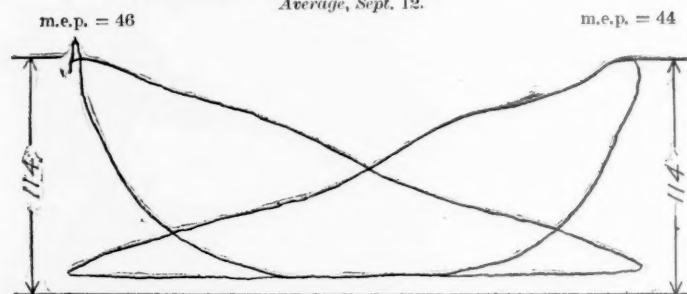
No. 5—Boiler pressure, 131; revs. per min., 184.  
Average, Sept. 8.



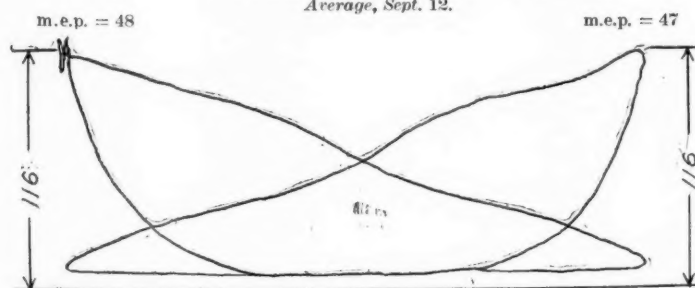
No. 6—Boiler pressure, 136; revs. per min., 192.  
Average, Sept. 12.



No. 7—Boiler pressure, 122; revs. per min., 208.  
Average, Sept. 12.

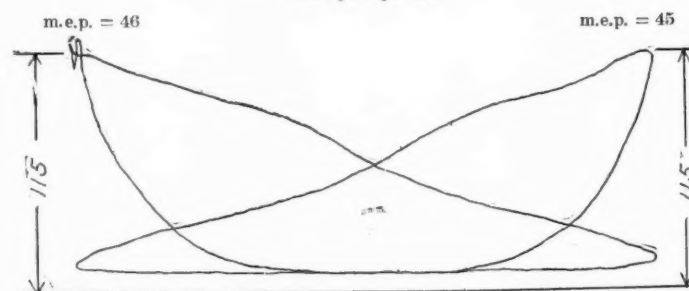


No. 8—Boiler pressure, 131; revs. per min., 204.  
Average, Sept. 14.



No. 9—Boiler pressure, 130; revs. per min., 188.  
Average, Sept. 15.

INDICATOR DIAGRAMS FROM LOCOMOTIVE No. 88,  
CENTRAL VERMONT RAILROAD, September, 1888.



No. 3—Boiler pressure, 134; revs. per min., 188.  
Average, Sept. 7.

less, and the point of cut-off shorter, than any of the remaining days. The rate of evaporation on the other test was necessarily less (with the same quality of fuel) because of the greater power exerted and the longer cut-off required—both against economical results.

As the coal used all came from the same region, it would be natural to suppose that, with the conditions of handling and burning the same, the results would be somewhat similar. Although the power developed varied widely from day to day, careful comparison proves the above supposition to have been borne out in all the tests, as the following figures show:

The coals used on the 5th, 6th, 7th, 8th, 14th and 15th were placed upon the tender in practically the same condition, and the results show that, had the indicated horse-power and other conditions been the same, the rate of evaporation would have been practically the same. For instance, the lowest evaporation of 5.34 lbs. water was on the 8th, when the power exerted (556.7 H. P.) was the highest; and the highest evaporation, of 6.62 lbs. water, was on the 7th, when the power exerted (408.4 H. P.) was the lowest. Now,

the averages of these evaporations and horse-power are 5.98 lbs. water, and 480 H. P., respectively, and comparing these with the results when 480 H. P. were exerted, as on the 5th and 6th, and we find the evaporation to be 5.94 lbs.—a difference of only  $\frac{1}{100}$  of a pound.

Again, taking the average evaporation and power on the 8th and 15th, which are respectively 5.70 lbs. and 522 H. P., and comparing with those of the 14th, when practically the same horse-power was exerted, and the evaporation is found to be 5.80 lbs.—a difference of  $\frac{1}{10}$  of a pound, or less than 2 per cent.

Again, the average evaporation and power for the 5th, 6th, 7th, 8th, 14th and 15th are 5.96 lbs. and 493 H. P., respectively. Comparing these figures with those of the 15th, when nearly the same power is shown, and we find an evaporation of 6.07 lbs., or  $\frac{1}{100}$  more than the average, a difference too small to affect the general conclusion. An interesting point to notice is, that on the 5th, 6th and 15th the "pounds of coal per mile" are respectively 54.46 and 50.69, while the power developed is 480 and 488; the less coal burned being in favor of the highest power exerted, while the boiler pres-

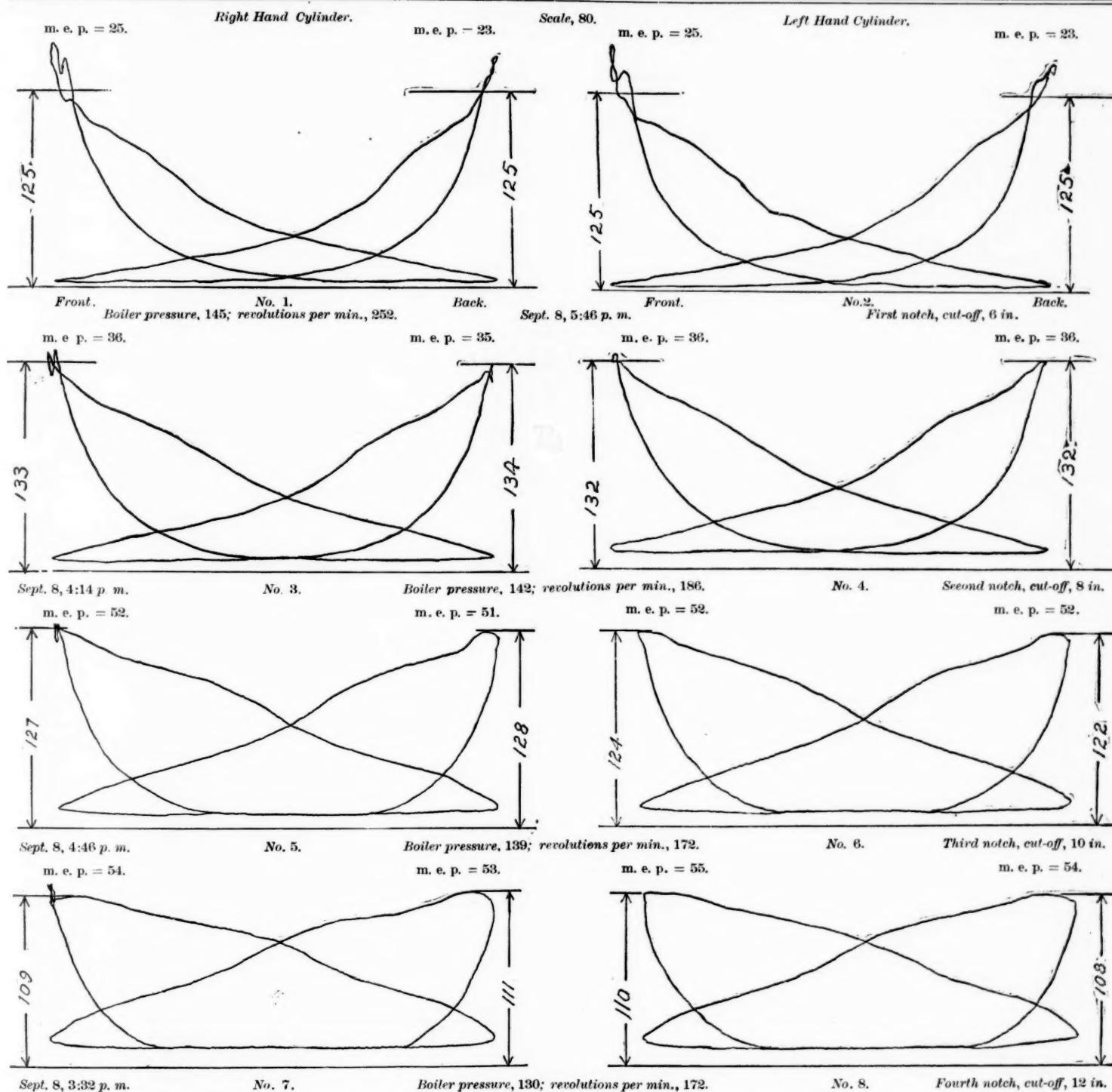
ures vary but little. The initial pressure on the 15th, however, was higher, and the point of cut-off much shorter than on the 5th and 6th, which facts would account for the increased economy.

The above comparison of evaporations has been made from the observed conditions, as the reduction to the basis of evaporation from and at 212 degrees, makes but a slight variation.

It will be noticed on Table No. 2, that the coal used on the 13th was handled four times in transportation and before being used on the engine, and to this increased handling may be attributed the decrease of 6.7 per cent. in evaporation compared with the results of the 8th, when about the same average power was developed.

The failure of a portion of the indicating apparatus on the 13th, and the fact of the single day's test does not make the above figures conclusive, but, as the coal was the same as used on the remaining days, it would seem that the extra handling so broke up the coal as to render it less valuable in generating steam, more coal being drawn through the tubes in fine particles.





INDICATOR DIAGRAMS FROM LOCOMOTIVE No. 88.  
CENTRAL VERMONT RAILROAD, *September, 1888.*

*General Remarks.*—The tests show, clearly, that the fuel used was an excellent quality of bituminous coal, and that the rate of evaporation was above the average of locomotive boilers doing less work.

The indicator diagrams show that the steam was very evenly distributed in the cylinder, and the remarkable

equality of the mean effective pressure for both ends of the cylinder at all points of cut-off show one of the best arranged link motions.

Attention is called to the difference between the boiler pressure and the initial pressure in the cylinder—a very common fault, due in a large measure to the small throttle open-

ing given by the engineer. The least difference between the two was 16.3 lbs. on the 7th, when the best results were obtained. There is no just reason why the difference between these two pressures should be more than from 8 to 10 lbs.

In two of the diagrams it was found that the boiler pressures vary but 3 lbs., while the least difference in initial

TABLE NO. 1.  
*Dimensions of Locomotive 88 Central Vermont Railroad.*  
BOILER.

(Wagon-top—Extension Arch.)	
Diameter of waste (smallest course).....	50 in.
Number of 2-in. tubes .....	180
Length " fire-box inside.....	11 ft. 6 in.
Width " " ".....	72 in.
Height " " ".....	36 in.
Area " grate.....	.70 in. front, 68 in. back.
Heating surface.....	18 sq. ft.
" " ".....	tubes, 967 "
" " ".....	fire-box, 72 "
" " ".....	total, 1,039 "
Area for draught through tubes.....	1432 sq. in.
" " " stack.....	201
Ratio of heating surface to grate surface.....	57.7 to 1
" " grate " area through tubes..	1 to 1
" " " " " stack.....	12.9 " 1
Diameter of dry pipe (inside).....	4½ in.
Safety valves set at 145 lbs.	
<b>CYLINDER.</b>	
Diameter of cylinder.....	18 in.
Stroke of piston.....	24 in.
Diameter of piston rod.....	3 in.
Length of steam port.....	14 in.
Width of " " ".....	1¼ in.
Length of exhaust port.....	14 in.
Width of " " ".....	2¼ in.
Outside lap of valve.....	27-32 in.
Inside " " ".....	1-32 in.
Travel of valve.....	5 in.
Style of exhaust tip.....	Individual
Diameter of exhaust tip.....	3 in.
Top of tip from bottom of stack.....	12 in.
Inside diameter of stack.....	16 in.
Weight of engine (loaded)....	= 80,000 lbs.
Weight on drivers.....	= 54,000 lbs.
Diameter of drivers.....	= 68 in.

TABLE NO. 2.  
Results of Tests upon Locomotive No. 88, Central Vermont R. R. Conducted by H. G. Manning for the Eames Brake Co.  
8-wheeled engine, 50" boiler, 72" fire-box, 18" x 24" cylinder.

Date.	September, 1888.	3 and 4.	12.	13.	5 and 6.	7.	8.	14.	15.
Duration of test.....	hrs.	7 h. 45 m.	3 h. 15 m.	2 h. 45 m.	7 h. 45 m.	4 h. 50 m.	2 h. 45 m.	3 h. 10 m.	3 h. 0 m.
Weight of coal fired (including wood equiv.)....	lbs.	23,560.	10,794.	8,840.	14,705.	6,813.	7,477.	8,989.	6,083.
" water fed.....	lbs.	91,887.	47,688.	44,009.	87,338.	45,069.	30,921.	52,184.	36,924.
Pounds of water evaporated per lb. of coal.....	lbs.	3.90	4.42	4.98	5.94	6.62	5.34	5.80	6.07
Average indicated horse power.....	lbs.	515.3	*573.3	480.8	403.4	556.7	537.5	488.8	488.8
" boiler pressure.....	lbs.	132 3	122.4	*138 6	131.1	130.8	132.4	135.2	135.2
" initial " in cylinder.....	lbs.		99.1	*118.4	113.5	114.5	115.0	117.8	116.2
" point of cut-off.....	ins.		11.36		10.84	9.84	11.02	10.06	9.92
" (per cent.).....		.473			.439	.410	.450	.419	.413
" mean effective pressure.....	lbs.	42.0	40.9	456.73	47.37	40.30	50.86	43.17	46.40
" revolutions per minute.....	lbs.	168.9	201.9	415.4	166.9	164.7	180.8	204.8	174.0
Pounds of coal burned per hour.....	lbs.	3,040.	3,319.	3,215.	1,897.	1,411.	2,716.	2,836.	2,028.
" water fed.....	lbs.	11,849.	14,673.	16,003.	11,209.	9,337.	14,517.	16,461.	12,308.
" per horse power per hr.....	lbs.	28.47	27.91	23.44	23.15	26.08	30.63	25.18	
" coal " " " " " " " " " " " " " "	lbs.	6.44	5.61	3.94	3.49	4.88	5.28	4.15	
" per sq. ft. grate surf.....	lbs.	168.8	184.3	178.3	105.4	78.4	151.0	157.5	112.7
Number of miles run.....		270.	150.	120.	270.	150.	120.	150.	120.
Pounds of coal burned per mile run.....		87.26	71.89	73.67	54.46	45.42	62.31	59.93	50.69
Miles run per ton of coal.....		23.92	27.82	27.15	36.72	44.03	32.10	33.38	39.45

\* Computed for portion of run, from coal and water consumption. † Portion of run only.  
Average temperature of feed water in tank, 58°.

pressures in 9 lbs. Also, that the mean effective pressures are practically the same. Now, if the number of revolutions per minute had been the same in the two cases, the form of the diagram would not have been changed materially, and there seems to be no good reason why a diagram similar to the best could not have been made the average card for the 7th, instead of the one actually obtained, in which case the average point of cut-off would have been 8 in. instead of 10 in. of the stroke, and a much more economical result obtained. The writer is of the opinion that an average of 122 lbs. initial pressure could have been had on the 7th, instead of the 114.5 lbs. realized, and even more than 122, provided an average boiler pressure of 135 lbs. was maintained, as on the 14th and 15th.

In general, each day's test supports the others, but it will be noticed that on the 12th and 14th the water consumption per horse-power per hour is large compared with the water consumption and given mean effective pressures of the remaining days. On the 12th and 14th the train pulled was express, calling for 20.5 per cent. increase in speed above the average of the other tests, and, without doubt, owing to the rapid generation of steam required for this speed, considerable water mechanically mixed with the steam found its way into the cylinders, for on the 14th the steam consumption, figured from 119 sets of diagrams, accounts for only 72 per cent. of the actual consumption, while on the 7th, when the speed was slower, 84 sets of diagrams account for 80 per cent. of the actual consumption, the point of cut-off on these two days being practically the same.

The consumption of steam from the diagram was obtained by taking the pressure at 14 in. of the forward stroke, and 3 in. from the end of the return stroke, these points having been chosen because of the certainty that the pressures were measured on the expansion and compression lines at all points of cut-off.

As a rule, the tests shows that the loads which the engine pulls are excessive for the best results from the cylinder, and, as a consequence, the boiler is forced hard to supply the requisite quantity of steam.

That, had a higher percentage of the average boiler pressure being obtained in the cylinder, a higher ratio of expansion and its attending economy would have resulted.

That the steam is as perfectly distributed in the cylinders as can practically be expected from the link motion.

#### New Construction in 1889.

The accompanying table shows the new track laid during the first six months of 1889 in the United States, Canada and Mexico. The lines under construction are also given in the table.

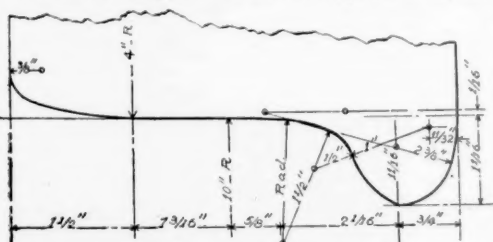
The new track laid is, by states, as follows:

Alabama	17.8	New Jersey	23.8
Arkansas	3	New York	85.8
California	44	North Carolina	102.2
Colorado	70.3	Ohio	54.1
Connecticut	0.5	Pennsylvania	28.7
Dakota	3.8	Tennessee	96.5
Georgia	115.2	Texas	91
Florida	30.8	Virginia	42.1
Illinois	13.8	Washington	55.5
Indiana	19	West Virginia	24.8
Indian Ter.	32		
Kansas	25.2	Total U. S.	1,409.5
Kentucky	6	Manitoba	32
Louisiana	73.5	New Brunswick	11.2
Maine	3.3	Nova Scotia	3
Maryland	4.8	Ontario	35
Michigan	14.5	Mexico	132.8
Minnesota	28		
Mississippi	140	Total foreign	234
Missouri	55.6		
Montana	43.9	Grand total	1,643.5

#### A Wheel to Fit the Rail.

We illustrate herewith a wheel tread which has been adopted as a standard by the Chicago, Milwaukee & St. Paul. and is now in service for a very large number of wheels. The tread was designed by Mr. Barr, and 100 chilled wheels were cast on these lines and put in service about 4 or 5 years ago. Not one of those wheels has been scrapped for sharp flanges, and the tread seems to be giving very excellent results in all classes of service.

It will be noticed that from a point on the circumference of the wheel, about the centre line of the rail head, a curve is struck towards the flange, with a 10-in. radius. This radius was used as being the radius of the rail head of the St. Paul. This curve is compounded into one of 1 1/2 in. radius, then



into one of 1/2 in. radius, making a long fillet of easy curves. On the outside of the curved portion of the section of the tread, the wheel is cylindrical for 1 1/8 in., and then begins a curve of 4 in. radius.

This wheel was designed for the purpose of distributing the pressure over as large an area as practicable. It was considered that a rail head cannot be kept flat, and that, therefore, with a cylindrical wheel tread the contact would be along a line as soon as the section of the rail head had been modified by wear. Therefore, it being recognized that the top of a rail must be curved, it was decided to adapt the section of the wheel tread to the section of the rail. The

#### NEW CONSTRUCTION AND SURVEYS, JANUARY 1 TO JULY 1, 1889.

NAME OF ROAD.	Track laid between Jan. 1 and July 1.			Under Construction.		
	From.	To.	Miles.	From.	To.	Miles.
Alabama Midland	Bainbridge, Ga.	Chattahoochee Riv.	32.5	Chattahoochee Riv.	Ada, Ala.	128
Albemarle & Pantego	End of track	End of track	3	End of track	Haslin, N. C.	15
Alleghany & Kinzua	Deer Lick, N. Y.	Freck's, N. Y.	5.5			
American Midland	Ottawa, O.	Glendora, O.	2			
Annapolis & Balt. Short Line	Giddings Sta.	Annapolis, Md.	2			
Astoria & South Coast	Skipanon, W. T.	South	0.5	Skipanon, W. T.	South	12
Athens & Jefferson				Athens, Ga.	Jefferson, Ga.	18
Atlanta & West Point				Atlanta, Ga.	East Point, Ga.	6
Atlantic Coast Line						
Albemarle & Raleigh	Scotland Neck, N. C.	Bethel, N. C.	24	Williamston, N. C.	Plymouth, N. C.	24
Atlantic & Danville	Hodge's Ferry	Portsmouth, Va.	6	Bethel	Greenville, N. C.	14
Augusta & Southeastern	Coats River	Gregory's, Ark.	3	Lawrenceville, Va.	Danville, Va.	110
Austin & Northwestern	Burnet, Tex.	Marble Falls, Tex.	16			
Baltimore & Dela. Bay				Nicholson	Toilechester, Md.	80
Baltimore & Drum Point				Baltimore	Drum Point, Md.	80
Baltimore & Eastern Shore				Salisbury, Md.	Eastern Bay, Md.	55
Baltimore & Sparrows Point	Sparrows Point, Md.	Penwood Park	0.8			
Baton Rouge, P. & Mobile	Burtville	Burtville Mills, La.	6			
Beaver Creek & Cumberland Coal	In Cumberland, Mt., Ky.	Northward	2			
Bloomington & Sullivan	Camden City, Pa.	Waterford, Ont.	0.7			
Brantford, Waterloo & Lake Erie	Brantford, Ont.	Lynn, Ont.	5			
Brooklyn, Westph. & S. Ste. Marie	Brookville, Ont.					
Brookfield				Brookfield, N. Y.	N. Br'kfield, N. Y.	7
Buffalo, Rochester & Pittsburgh						
Lincoln Park & Charlotte				Lincoln Park, N. Y.	Charlotte, N. Y.	10
Canadian Pacific						
Ontario & Quebec				London, Ont.	Windsor, Ont.	112
Cape Breton	Dan River Bridge	Madison, N. C.	23	Point Tupper	No. Sydney, N. C.	98
Cape Fear & Yadkin Valley	Williamsville, Mo.	Hunter, Mo.	23	Fayetteville, N. C.	Wilmington, N. C.	81
Cape Girardeau Southwestern	Oswegatchie, N. Y.	Turtle River, N. Y.	4.5			
Carthage & Adirondack				Norton, N. B.	Chipman, N. B.	44
Central (New Bruns.)						
Central New England & Western	Campbell Hall, N. Y.	Highlands, N. Y.	29			
Hudson Connecting	Poughkeepsie, N. Y.	Silvernails, N. Y.	27			
Poughkeepsie & Connecticut						
Savannah & Western	Columbus, Ga.	Buena Vista, Ga.	36.2	Eden, Ga.	Westward	50
Centralia & Chester	Sparta, Ill.	Coulterville, Ill.	8	Coulterville, Ill.	Centralia, Ill.	33
Charleston, Cinn. & Chic.				Johnson City, Tenn.	Minneapolis, Va.	90
Chattanooga Southern	Georgia state line	Rock Creek, Ga.	3	Rock Creek, Ga.	South	7
Chattanooga Union	Tinkler's, Tenn.	Sherman Heights	1	East End, Tenn.	Mountain Junct.	3
Chesapeake & Ohio						
Point Creek Branch						
Chico Creek Branch						
Chicago Burlington & Quincy						
Burlington & Missis. River				Alliance, Neb.	Northwest	110
Chicago, Kalamazoo & Saginaw	Kansas City, Mo.	Linden, Mo.	8	Hastings, Mich.	Northwest	14
Chicago, Kansas City & Texas		Fair Grounds	1.6	Linden	North	6
Cincin. Ala. & Atl.				Tullahoma, Tenn.	Huntsville, Ala.	55
Cincinnati, Ham. & Dayton	Wyoming, O.	Lockland, O.	0.7			
Clay Springs & Apopka	Clay Springs, Fla.	Apopka, Fla.	5			
Cleaveland & Jefferson	Horatio, Pa.	Coal Colliery	1	Akron, O.	Coal mine	3
Cleve. Akron & Columbus						
Cleveland & Canton						
Coshocton & Southern	Coshocton, O.	Zanesville, O.	28.5			
Cleveland, St. Louis & Kan. City	West end of tr'k, Mo	Westward	6	Sherrodsville, O.	Martin's Ferry, O.	46
Cleveland & Wheeling				Columbus, Ga.	Albany, Ga.	87
Columbus Southern				Confluence, Pa.	Yough Manor, Md.	20
Confluence & Oakland						
Corwall & Lebanon						
Mt. Gretna Narrow Gauge	Mt. Gretna Park, Pa.	Governor Dick	4	Covington, Ky.	Ludlow, Ky.	2
Covington Transfer				Eagle Rock, Va.	Silent Dell	10
Craig Mineral						
Cumberland Ry. & Coal Co.	End of track	Oxford, N. S.	3	Darkeville, W. Va.	Winchester, W. Va.	15
Cumberland Valley	Martinsburg, W. Va.	Darkeville, W. Va.	7	Dallas, Tex.	Northwest	15
Dallas, Pacific & Southeastern				Dallas, Tex.	Farmsdale, Ala.	9
Dayton & Fannsdale						
Deadwood & Central	Deadwood, D. T.	Lead City, D. T.	3.8	Shelbyville, Tenn.	Fayetteville	30
Decatur, Ches. & New Or.				Denison, Tex.	Bonham, Tex.	20
Denison, Bonham & N. Orleans						
Denison & Washita V.						
Denver & Rio Grande	Lehigh, I. T.	Coalgate, I. T.	10			
	Sapinero, Col.	Lake City, Cal.	36			
	Glenwood Springs	Rifle Creek, Cal.	27			
	Forbes Junc., Cal.	Victor Mines	7.3			
				Dexter, Me.	Foxcroft, Me.	16
	Globe Run, Pa.	Wild Run, Pa.	4	Dover, Ga.	Statesboro, Ga.	10
	Duluth, Minn.	Bayview	3			
	Red Wing, Minn.	Zumbrota, Minn.	25			
	Creedmoor, N. C.	Neuse River	7			
	Willard, Ky.	Webbville, Ky.	2			
	Main line	Stone quarries	0.5			
	Havelock, Sth. N.B.	Kutts Mills	1.2			
	Empire, Ga.	East	12			
				End of track	Dublin, Ga.	6
				Empire, Ga.	Hawkinsville, Ga.	12
				Santee River	Sumter, S. C.	25
					In Newburgh, Ind	1
Eutawville						
Evansville, Suburban & Newburgh	Evansville, Ind.	Newburgh, Ind.	10.5			
Evansville & Terre Haute						
Evans & Richmond	Elnora, Ind.	West	4	End of track	Richmond, Ind.	130
Fairhaven & Southern	Clover Hill, Va.	Skinquarter, Va.	7	Fairhaven, W. T.	Skagit River	30
Farmville & Powhatan				Skinquarter, Va.	Farmville, Va.	56
Florence Northern				Florence, Ala.	North	25
Florida Midland				Harpers Ferry, Va.	Kieslimmer, Fla.	14
Fort Payne Coal & Iron Co.				Fort Payne, Ala.	Coal mines	10
Fort Worth & Rio Grande	Granbury, Tex.	South	15	End of track	Colorado River	120
Freehold & New York						
Keyport	Keyport, N. J.	Lorillard Brick Wk	2.3	Lorillard Brick Wk	Hopping Jn., N.J.	1
Genesis & Obed River	Genesis, Tenn.	South	2	Cinn. South, R. R.	Deer Lodge	6
Georgia Pacific	Columbus, Miss.	Baird, Miss.	140			
Georgia South. & Florida	Valdosta, Ga.	162-mile post	24	End of track	Palatka, Fla.	112
Grafton & Upton				W. Upton, Mass.	Milford, Mass.	8
Grand Tower & Cape Girardeau				Grand Tower, Ill.	E. Cape Girardeau	28
Great Eastern				St. Thomas, Que.	St. Gregoire	20
Great Northern				New Glasgow, P. Q.	Montcalm, Que.	10
Hartsville				Darlington, S. C.	Hartsville, S. C.	10
Hecla & Torch Creek	Hecla, Mich.	Red Jacket mine	1			
Hoozee Tunnel & Wilmington				Readston, Mass.	Tannery	1
Houston Central, Ark. & Northern	Monroe, La.	Riverton, La.	25	Mer Rouge, La.	Pine Bluff, Ark.	1
	Monroe, La.	Mer Rouge, La.	27.5			
Iwaca & Shoal Water Bay	Tinkertown, W. T.	Shoal Water Bay	11.5			
Interoceanic	Pueblo, Mex.	San Martin, Mex.	33.7	San Martin	Nanacamilpa	29
	Veregas	End of track	3.2	Veregas	Arzacusac	29
				Peroti	Vera Cruz	125
Jacksonv. Tampa & Key West						
Jacksonville, St. Aug. & Hal. R	Jupiter, Fla.	Lake Worth, Fla.	1.5			
Jupiter & Lake Worth	Barry Station, N. Y.	Quarry	3.3	Jonesburg	Stonyville	1
Jones Mountain				Fairfield, W. Va.	Mines	9
Kanawha				End of track	Plattsburg, N. Y.	7
Kanona & Plattsburg	Kanona, N. Y.	Rinehaus Mills	5			
Kansas City, Ft. Smith & South	Neosho, Mo.	Splitlog City, Mo.	14	Birmingham, Ala.	Junction	63
Kansas City, Memphis & Birming.	Main line, Ala.	Coal shaft	3.2			
Kansas City & Southern	N. Clinton, Mo.	Clinton, Mo.	2			
	Oseola, Mo.	Marshville, Mo.	1			
Kansas City, Watkins & Gulf				Lake Charles, La.	North	50
Kansas City, Wy. & N. W.	Axtell, Kan.	Summerville, Kan.	12.2			
Kentucky Midland	Frankfort	Georgetown, Ky.	23	Georgetown	Paris, Ky.	17
Kentucky Union	Winchester, Ky.	Union Junct., Ky.	6.5	End of track	Jackson, Ky.	71
	Clay City, Ky.	South	15			
	Knoxville, Tenn.	Clinch River	30	Clinch River	Cumb. Gap, Tenn.	63
	Lake Erie, Essex & Detroit River	Ruthven, Ont.	4			
Lake Shore				Alton, N. H.	Lake Village, N.H.	17
Lake Temiscamingue	Gordon Creek	Kippewa Lake, Ont.	9			
Lehigh Valley				In Allentown, Pa.		2
Long Island	Locust Valley, L. I.	Oyster Bay, L. I.	4			
Louisville, Hardinsburg & Western	Pineville, Ky.	Cannon Creek	7	Irrington, Ky.	Fordsville, Ky.	42
Louisville & Nashville	Oneonta, Ala.	Ore Mines, Ala.	3.5	Gate City, Ala.	Graces, Ala.	10
Birmingham General	Gurley, Ala.	Abernatis, Ala.	1.1			
	Memp. & Chas. R.R.	Sheffield, Ala.	1.5			
Nashville, Flor. & Shef.	In Indianapolis		5	City Limits	Massachusetts Ave.	2
Louisv., New Albany & Chicago						
Louisv., New Albany & Corydon	Corydon, Ind.	King's Cave, Ind.	4			



## NEW CONSTRUCTION AND SURVEYS, JAN. 1 TO JULY 1, 1889—(Continued.)

NAME OF ROAD.	Track laid between Jan. 1 and July 1.			Under Construction.		
	From.	To.	Miles.	From.	To.	Miles.
Louisv., New Orleans & Texas	Slaughter, La.	Bayou Sara.	15	Rosedale, Miss.	Coahoma, Miss.	51
Bolivar Branch				Rolling Fork.	Hampton, Miss.	10
Louisville Southern				Lawrenceburg, Ky.	Lexington, Ky.	24
Lynchburg & Durham	Rustburg, Va.	End of track.	10	Near Winfall, Va.	Durham, N. C.	95
Maine Central				Fabyan's, N. H.	Scott Mills, N. H.	17
Marietta & North Georgia	Blue Ridge, Ga.	Ducktown, Tenn.	15	Ducktown.	Knoxville, Tenn.	85
Marion Belt & Chingawassa Spr.	Marion, Kan.	Chingawassa, Kan.	8			
Maryland Central				Belair, Md.	Stafford, Md.	16
Deer Creek & Susquehanna						
Mason County Central	Shelton, W. T.	Southeast.	3	Birmingham, Ala.	Levisburg, Ala.	4
Mary Lee Coal & Ry. Co.				Birmingham.	Forest City, Ala.	2
				Lewisburg.	Mines.	3
Meridian, Waterbury & Conn.	End of track.	Waterbury, Conn.	5			
Mexican Central.	Salinas, Mex.		39.9	Cardenas.	San Luis Potosi.	31
				San Luis Potosi.	Ojo Caliente, Mex.	162
Mexican Nat. Const. Co.	Ameria, Mex.	Collima, Mex.	32	Near Zacatecas.		25
Middleburg, Highland & L. Butler	Middleburg, Fla.	Highland, Fla.	9	Flambeau, Ind. Ros.	Hurley, Wis.	41
Midwaukee, Lake Shore & West.				Branch.		3
Minnesota & Southeastern						
Missouri Pacific						
St. Louis, Iron Mt. & So.	Coffeyville, Kan.	South.	27	End of track.	Wagoner, Ind. Ter.	82
Monongahela River				Fairmont, W. Va.	Clarksburg, W. Va.	32
Monterey & Mexican Gulf	Monterey, Mex.	Monte Morelos, Mex.	56	Monte Morelos, Mex.	Victoria, Mex.	119
Mt. Jewett, Kinzua & Titertville.				Mt. Jewett, Pa.	Riterville, Pa.	5
Napawee, Taworth & Quebec				Taworth, Ont.	Tweed, Ont.	20
Narragansett Pier				Narragansett Pier.	South Ferry, R. I.	7
Nashville, Chat. & St. Louis.				Dickson, Tenn.	Worley, Fur.	7
Nashville & Knoxville				Buffalo Val., Tenn.	Cookeville, Tenn.	22
Nevada-California-Oregon				Lassen Co., 70th mile	E23d mile, Cal.	53
New Westmins., Belling. Bay & S.				New Westmins., B.C.	Whitcom, W. T.	14
New York, Ontario & Western:						
Ont. Carbonate & Seranton				Hancock, N. Y.	Seranton, Pa.	54
Norfolk & Carolina	Drivers, Va.	Shingle Creek, Va.	6	Shingle Creek, Va.	Tunis, N. C.	30
	Tarboro, N. C.	Tar River, N. C.	3.5	Rosobol, N. C.	Tar River, N. C.	23
Norfolk & Western:						
Clinch Valley Div.	End of track.	Pound, Mill St., Va.	10	End of track.	Norton, Va.	74
Northern Pacific	Laurel Junc., Mont.	Red Lodge, Mont.	43.9	Little Falls, Minn.	Staples, Minn.	34
				Gallatin, Mont.	Butte, Mont.	72
Northern Pac. & Manitoba	Winnipeg, Man.	Portage La Prairie.	52	Morris, Man.	Brandon, Man.	140
Nova Scotia Central.				Middleton, N. S.	Lunenburg	73
Onathee Valley						
Ohio Valley	Henderson Ky.	Evansville, Ind.	10.5	No. Attleboro, Mass.	Walpole, Mass.	12
Old Colony				Rockland, Mich.	H.C.K. Sidg. Mich.	26
Ontonagon & Brule River				Greycourt, N. Y.	Burnside, N. Y.	10
Orange Belt	Monroe, Fla.	Sanford, Fla.	4			
Orange County				Tekoa, Wash.	Mullan, Id.	87
Oregon Ry. & Navig. Co.	East W. T.	End of track.	18.5	Seltice, Wash.	Winona, Wash.	35
Pleasant Val. Branch				Walla Walla.	Whetstone Hol.	45
Oregon & Washington						
Owensboro, Falls of Rough &				Owensboro, Ky.	Fordsville, Ky.	26
Green River.				Oxford Junc.		47
Oxford & New Glasgow.						
Pacific Short Line:				Sioux City, Neb.	Plainview, Neb.	80
Nebraska & Western						
Pawnee	Pawnee	Jet. St. L. & C.R.R.	5.9	Portland	Slatington, Pa.	46
Pennsylvania, Pough. & Boston.	Pine Island, N. Y.	Augusta, N. J.	21			
	Portland, Pa.	Pen Argyle, Pa.	11			
Phila. & Reading:						
Atlantic City	Jefferson, N. J.	Mullica, N. J.	1.5			
Port Clinton Short Line.	Port Clinton, O.	West.	12.5			
Port Townsend Southern.				Pt. Townsend, W. T.	South.	6
Rail River	Washington, N. J.	West.	2	Washington, N. J.	N. Brunswick, N. J.	106
Red River, Sabine & Western	Nacogdoches, Tex.	San Augustine, Tex.	5	San Augustine, Tex.	Palestine, Tex.	100
Richmond & Danville:						
High Point, Randle, Ash. & So.	High Point, N. C.	Ashboro, N. C.	27.9			
Northwestern N. C.	Winston, N. C.	Rural Hall, N. C.	13.6			
Western N. C.	Jarrett, N. C.	Valleytown, N. C.	7.0			
Rich., Nich., Irvine & Beattyville				Nicholsville, Ky.	Richmond, Ky.	22
Roanoke & Southern	Winston, N. C.	Walnut Cove, N. C.	18	Walnut Cove, N. C.	Martinsville, Va.	43
Rochester & Glen Haven	Rochester, N. Y.	Irondequoit Bay.	3.5			
Rockaway Valley				N. Germant'n, N. J.	Portersville, N. J.	4
Rogers & Summit.	Summit, Ga.	Stillmore, Ga.	5.5	South B. Junction.	South Beach, Fla.	3
St. Augustine & So. Beach.				Berien Springs.	St. Joseph, Mich.	3
St. Cloud & Sugar Belt.	Runnymede, Fla.	Narcessos, Fla.	3.6	Buchanan, Mich.	Niles	70
St. Joseph's Valley				Guadalupe River.	Llano, Tex.	20
San Antonio & Aransas Pass.	End of track.	Houston, Tex.	15	Shiner, Tex.	Gonzales, Tex.	20
San Diego, Cal.	San Diego, Cal.	Lakeside, Cal.	22			
San Francisco & North Pac.	Hopland, Cal.	Raymond, Cal.	4	Monrovia, Cal.	Duarte, Cal.	3
San Gabriel Rapid Transit.	W. Alhambra, Cal.			Abbeville, Ga.	Oconee River.	45
Sav., Americus & Montgomery				Bowans, Pa.	Fremont Summit.	40
Schenck & Lehigh Valley						
Scioto Valley	Portsmouth, O.	Sciotoville, O.	5.4			
Seattle, Lake Shore & Eastern	Falls City, W. T.	East.	2	Falls City, W. T.	East.	10
Silverton	Corkscrew.	Albany, Cal.	4	Silverton, Cal.	Eureka, Cal.	9
Simsport	Embsen, Me.	Carrutunk Falls.	3	Carrutunk Falls.	Bingham, Me.	8
Sonora, Inaloe & Chihuahua				Guaymas, Mex.	Topobolampo.	220
South Atlantic & Ohio				Clinch River.	Big Stone Gap, Va.	17
South Brunswick Ter.				Waynesville, Ga.	South Brunswick.	26
Southern Pacific:						
Atlantic System	Victoria, Tex.	South.	40	End of track.	Beeville, Tex.	15
Pacific System				Newman, Cal.	Tulare, Cal.	110
Suncook Valley Extension				Pittsfield, N. H.	Barnstead, N. H.	4
Spokane Falls & Northern	Spokane Falls.	North.		Colville, W. T.	Roselle, N. J.	68
Staten Island Rapid Transit.				Arthur Kill Bridge.	West.	10
Tacoma, Olympia & Chehalis Val.	Barclay's, Ala.	Talladega, Ala.	2.5	Centralia, W. T.		
Talladega & Coosa Valley	Huron, Tenn.	Jackson.	50	Tennessee River.	Nashville.	90
Tennessee Midland				Belmont, N. H.	Tilton, N. H.	4
Tilton & Belmont.				Perth, N. B.	Trout Lake, N. B.	14
Tobique Valley	Harriette.	Sherman, Mich.	10	Sherman, Mich.	Weldon, Mich.	22
Toledo, Ann Arbor & N. Mich.						
Union Pacific:						
Salt Lake Valley & Eastern				Silver City.	Eureka, Utah.	10
Union Point & White Plains.				Union Point, Ga.	White Plains, Ga.	13
Utica & Unadilla Valley				Bridgewater, N. Y.	New Berlin, N. Y.	16
Vancouver, Klickitat & Yakima.				Nr. Vancouver, W. T.	East.	5
Western Counties				Digby, N. S.	Annapolis, N. S.	20
Western Maryland.	Fairfield, Pa.	Highfield, Md.	11	N. Interest, W. Va.	Elkins, W. Va.	7
West Virginia Central	Parsons, W. Va.	New Int'l, W. Va.	17	Williamsport, Pa.	Bingham't'n, N. Y.	55
West Virginia, Pineville & Tenn.	Pineville, W. Va.	Coke Ovens.	8			
Williamsport & Binghamton						
Zanesville & Ohio River						
Shavnee & Musk. River	Drakes, O.	Rendville, O.	5			
Zealand Valley	Zealand Notch, Me.	Thompson's Falls.	3			
Total.			1643.5			4,451

## The Troubles of Locomotive Runners.

Under the head of "Three Dangerous Trains," the Topeka (Kan.) Capital thus interviews an engineer: "There are three kinds of trains that I do not want to have anything to do with," said an old Santa Fe locomotive engineer. "One is the pay train. You never know when you will overtake the section hands. You will be going at the rate of forty miles an hour, away you go around a curve and you will dash by the boss and hands and have to back to them. There is always a good deal of talk over the wages and much time is taken up. The next unpleasant train to handle is an excursion train. Every one living along the line of road knows you from seeing you come by every day, and they think you know them as well. When upon an excursion they presume upon their friendship to endeavor to ride on the engine. No other place will do them. The engineer has to refuse them, as it is positively against the rules of the road. The person denied the privilege always feels hard about it and looks upon the engineer as unaccommodating. The last and worst of all, however, is the officers' train. If you run slow they say you are scared and fear to run fast. If you make good time

they say you are careless and want to kill somebody. You can't suit them."

## The Automatic Photographic Apparatus.

This device, invented by Mr. Enjalbert is shown at the Paris Exposition. It is a high box similar to the well-known machines in which money is placed, and is designed to take a photograph of any one who puts 10 cents into the slot. An arm-chair is placed before the apparatus. The sitter, after making the payment required to operate the machine, follows with the eyes, upon a series of dials, the different operations which are performed within. A few instants before taking the picture, the hand of the second dial points to the words: "Get ready," then: "Do not move," and when it reaches the black sector containing the word "exposure," the shutter of the lens opens, and the bells above the dials ring during the exposure, which is usually from 3 to 6 seconds. In a short time, the whole operation not exceeding 5 minutes, the photograph is delivered at the side. This apparatus presents the sensitive plate, takes the picture, develops it, and finishes it by drying and varnishing, everything being done automatically.—La Nature.

theory seems to be a good one, and so far the results of practice have borne it out. The large fillet, struck with long radii, we consider also to be based on the soundest theories.

## Tests of Treated and Untreated Timber.

It is not quite a year now since the Lehigh Valley Creosoting Co. published the results of the examination of certain specimens of treated and untreated timber at the works of the company at Perth Amboy. After the examination of the specimens, April 30, 1888, they were put back into the water, and additional specimens were sunk in May of that year. The old and new specimens were examined last March, and the following information concerning the results is furnished by the company. We give it as a contribution to a subject on which accurate information is somewhat hard to get.

We have received from Mr. Focht the following particulars of the treatment of the specimens:

The creosoted specimens (those treated with "dead oil") were prepared by the Hayford process, or the one commonly employed in this county. They were treated with batches of similar kinds of wood, containing 12 lb. of oil per cubic foot. The oil used was what is commercially known as "dead oil," derived from the destructive distillation of coal tar.

The specimens treated with "coal oil residuum" were soaked in the hot fluid for about 20 hours. A similar method was employed in treating the fernoline specimens, the timber being soaked in the hot oil until the wood had stopped absorbing it. Upon examination of the fernoline specimens, it was found that the oil had penetrated the wood to a depth of more than 2 in. The dead oil in the creosoted specimens penetrated the wood to about the same depth also.

This method of applying fernoline oil to timber exposed to the action of the teredo is the one recommended by the Fernoline Chemical Co. in their circular. It is there indorsed by such parties as Ross & Sanford, the Pennsylvania Railroad Co., and others. The Pennsylvania Railroad, not long ago, in repairing their docks at South Amboy, treated the piles for the work in a similar way, by soaking them in a large tank filled with fernoline oil.

Seventy-five specimens of wood, placed in four iron frames, were sunk in sea water at Perth Amboy, N. J., on March 29, 1887. Another frame containing 13 specimens was sunk May 28, 1888. The frames were placed about 20 ft. apart. The specimens were full-sized pieces of piles, cross-ties and square dock lumber, each piece being about 2 ft. long. The following kinds of timber were experimented upon: White oak, red oak, tamarack, white cedar, spruce pine pile, yellow pine pile, chestnut, cypress, spruce pile peeled and with bark on. The antiseptics used were coal tar creosote or dead oil, fernoline or wood creosote oil, and coal oil residuum.

The specimens were examined April 30, 1888, and again March 20, 1889. The following extracts are from the report on the second annual examination of the specimens to Mr. A. W. Stedman, Chief Engineer of the Lehigh Valley Railroad Co., by Mr. Louis Focht, Assistant Engineer, under whose direction the tests have been conducted:

"When the examination was made last year the teredo had not attacked more than 50 per cent. of the untreated timber. This year every untreated specimen contains the teredo in various stages of development. Two pieces of bull pine piling are, however, to be excepted; but these were among the lot sunk last May, and in all probability this explains why they escaped attack.

"The timber treated with coal tar creosote (dead oil), after a thorough examination, was found to be entirely free of worms. The water had not washed the oil out to any perceptible extent, as was proven by boring into the wood with a small auger.

"Of the six specimens treated with fernoline oil (wood creosote), three were found to contain each from 10 to 19 worms. The oil was found 2 in. below the surface in two of the eaten piles.

"Coal oil residuum washes out, and apparently for this reason does not resist the attacks of the teredo, the specimens treated with it all being badly eaten.

"The above brief summary is a statement of the actual condition of these tests. The examination this year has brought out these facts of interest, and it can be expected that by next year still more developments will be noticeable."

After a continuous exposure of two years, therefore, the facts gathered from this report would indicate:

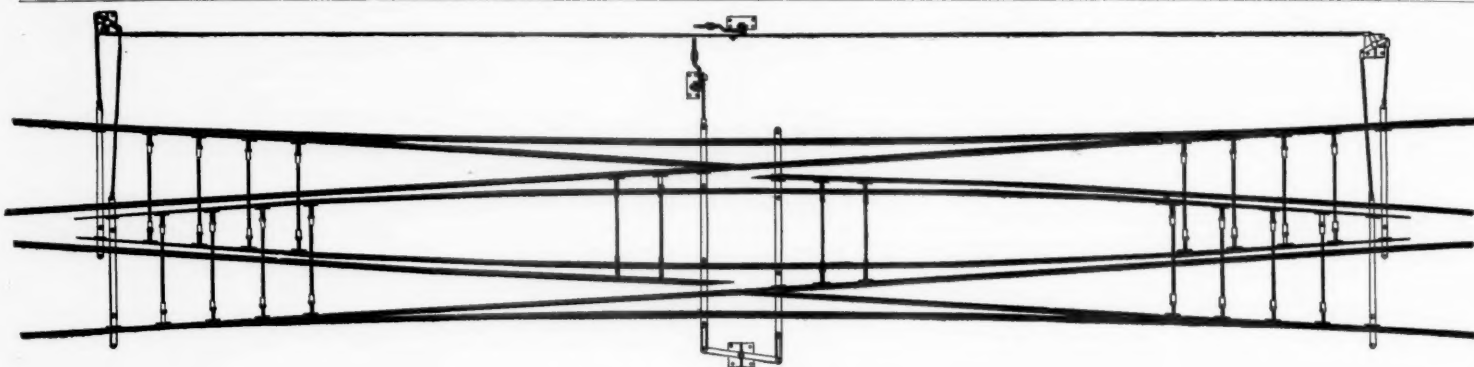
First—That for an exposure of two years at Perth Amboy coal tar creosote (dead oil) will resist the attacks of the teredo successfully.

Second—That under the same conditions fernoline oil (wood creosote) does not possess the qualities necessary to insure certain protection against the teredo. This is demonstrated by the fact that as many worms were found in the specimens treated with it as in the untreated ones.

Third—That coal oil residuum, on account of washing out, is not suited for treating piling in tidal waters.

## Movable Frog with Slip Switches.

The cut on this page shows the arrangement of rails and levers for the movable frog as used in interlocking by the Union Switch & Signal Co. There are five of these frogs in the interlocking at Jersey City, described in the Railroad Gazette of June 28. Experience with this device has proved it to be very efficient and durable, and it is especially valuable in a large and busy yard like that above referred to. The drawing shows also the arrangement of hand levers for



SLIP SWITCHES WITH MOVABLE FROGS.

use where interlocking is not employed. By the use of this arrangement, enabling the guard rails to be dispensed with, it is practicable to make the "slips" or connecting tracks of as long a radius as may be desired, thus making it safe to run cars at high speed. In a very busy yard the speed at which the switching engines move is an important factor in the facility with which the work is accomplished.

### Rack Cutting Attachment for Milling Machines.

The device shown herewith is a rack cutting attachment for milling machines arranged by the Brown & Sharpe Mfg. Co., of Providence, R. I. It consists of a special outer bearing for the regular milling machine arbor to which is attached a device driving a lateral shaft or spindle. Attached to this is the cutter for forming the teeth of the rack. *A* (see fig. 1) is the outer bearing on the milling machine; *B* is the milling machine arbor of the ordinary form.

This arbor is splined at *C* from the shoulder to the end. Into this spline, or groove, fits a feather or key which drives a bushing *D* (see figs. 2 and 3). This bushing *D* rotates in the outer bearing *A*, and drives a bevel spur gear *E*, to which it is screwed by a set screw *F*, as shown in fig. 3. The bevel spur gear drives a pinion gear *G*, which rotates upon a stud *H*, whose axis is at right angles to the axis of the spindle of the milling machine. Upon the stud also revolves a spur gear *I*, which is secured to, and, therefore, driven by the bevel pinion *G*. The attachment of the spur gear *I* and the bevel pinion *G* consists of three screws as shown.

The spur gear *L* drives a pinion *J*, which is keyed to an arbor *K*, which revolves in a lateral bearing of hardened steel, which is inserted as a bushing into the lower side of the outer bearing *A* of the milling machine. Upon the arbor *K* is mounted at *L* the rack cutter, which is of the ordinary form. From the foregoing it will be seen that the milling machine spindle drives by connecting gears a lateral arbor, upon which is placed the cutter to be operated. This arrangement renders available the whole length of the milling machine table for mounting racks or arbors holding gears to the cut. It will be noticed that the thickness of the shell of the outer bearing at *M* is reduced to a minimum; this allows the cutter to project below the machine a maximum distance. In addition to cutting racks and gears this attachment renders the machine available for a variety of work which the plain machine cannot perform. Fig. 4 shows a milling machine with the attachment in perspective. This cut shows clearly the casing—also shown in figs. 1, 2 and 3—which protects the operator from injury by the gears.

### Locomotive Journal Bearings.

While on my way home from the Niagara Falls convention of Master Mechanics, I rode on a recently designed locomotive. As I came up alongside of the engine the engineer was in the act of oiling the driving boxes. I noticed a look of anxiety on his face, and asked, "Does she run hot?" He answered, "Don't say a word. Get on and see." I did, and found that all the journal bearings, both driving boxes and trucks, ran uncomfortably warm, the former particularly. When we reached our destination I made a careful examination of the parts that gave the trouble, which, together with other similar inspections, have led me to the conclusion that in enlarging the boiler and other principal parts of the locomotive to meet the increasing demand for more power the proportions of journals and journal bearings have not received the attention that they deserve. The diameters of all the journal bearings upon the engine that I rode on were much smaller than they ought to have been, more particularly those of the engine truck. The same size box was used and the distance between the pedestal jaws was the same as those on smaller engines; but the axle was larger, therefore, to admit the larger sized axle and still use the same boxes; a sort of compromise had been made with the result that the axle had not been made large enough, the quantity of composition in the journal bearings was much less than it ought to have been, and finally the cellar had been cut away to such an extent that there was less space for waste and oil than there was with the smaller axle. Now when we consider the fact that the journal bearing was small we would naturally say that there ought by all means to have been plenty of facilities for lubrication, but we find the direct opposite. Under such conditions what can we expect but hot boxes? A journal of say five inches in diameter with a little handful of waste packed in solid under it could not under the average conditions run cool. Too much room for waste or other packing in the cellars is far better than too little.

I should not be surprised to find the oil and waste which we now use for lubricating the journal bearings of engine trucks displaced by a grease, and an elastic or springy substance used in place of waste. In fact, I know of an instance where some bearings recently packed in this way have run constantly for three months without any attention or additional grease.

A great many roads are using a cheap grade of lubricating oil, and, therefore, more bearing surface is required to carry the same load, else the bearings run hot. For an engine truck journal bearing I prefer a brass shell with crown bearing at least one inch wide, then fill the cavities on either side with best babbit metal.

The cavities should be thoroughly cleaned either by acid dipping or by sand blast. Then heat the brass and tin the cavities thoroughly, after which the babbitt metal should be poured while the tinning is still melted so that the babbitt adheres firmly to the sides and bottom of the cavities.

The hexagon form of brass seems to be the least objection-

Fig. 1.

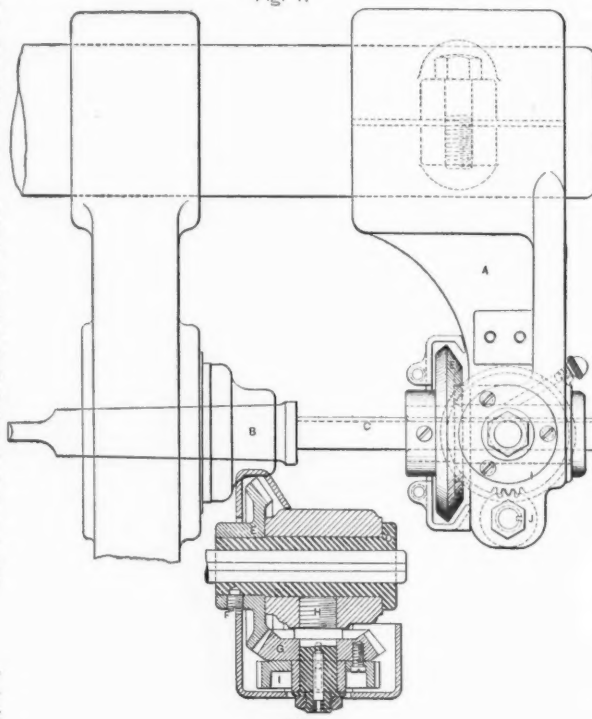


Fig. 3.

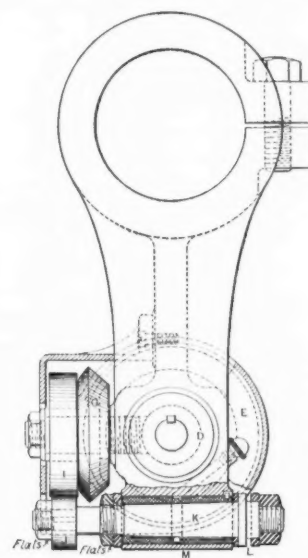


Fig. 2.

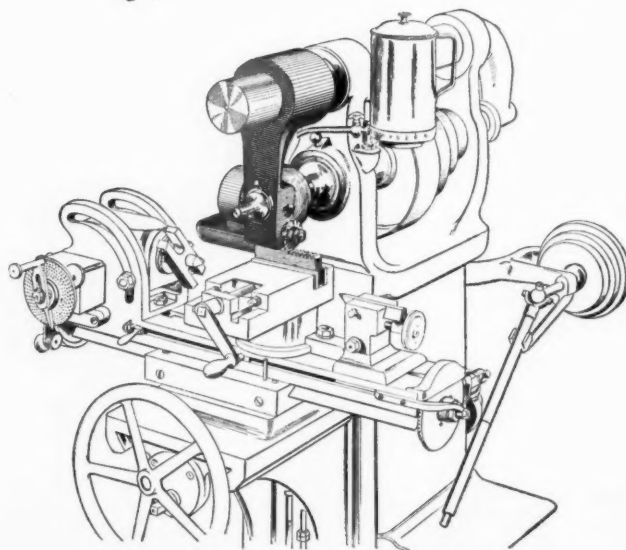
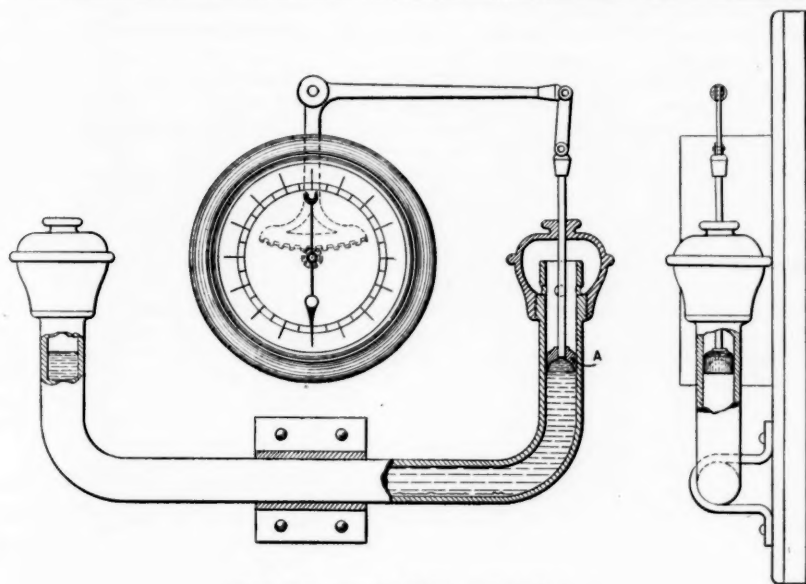


Fig. 4

RACK CUTTING ATTACHMENT FOR MILLING MACHINES.

Made by BROWN & SHARPE MFG. CO., Providence, R. I.





ARNOLD'S RETARDATION INDICATOR.

the box has little weight because they can be so easily repaired.

To my mind the present form of crescent-shaped driving-box brass is one of the most objectionable things about a locomotive, for the reason that the very first process of applying it springs the cast iron shell at least one-sixteenth of an inch. When the cellar has been fitted and the box placed on the engine it is not many weeks before the brass begins to work loose and the cellar has to be removed with a sledge. This has been my experience and I served my time on this style of driving boxes. I have also used the solid composition boxes. I may say that solid composition boxes sometimes fail because of the poor quality of composition.

Owing to the sharp competition in the brassfounding business there are persons unscrupulous enough to bid to furnish a railroad with pure copper and tin castings at a price which would not cover the cost of the two metals, to say nothing of the fuel and labor required in casting. The only way out for such a contractor is to use mostly scrap metal, and as a consequence we have hot bearings and a wholesale destruction of axles.

LEWIS F. LYNE.

#### Retardation Indicator.

This indicator, shown herewith, is the invention of Mr. W. H. Arnold, of Rensselaer Polytechnic Institute, Troy. It is devised to show principally to the person operating the air brakes the speed at which the train's momentum is being overcome, so as to prevent a too rapid stoppage of the train, and the discomfort it causes to the passengers.

It consists of a tube horizontally arranged, within a car or the cab of a locomotive, parallel with the direction in which the train is to move, the tube being turned up at the ends. The tube is partially filled with mercury; therefore, if the velocity of the train is changed the inertia of the mercury will cause it to run up into the curved ends—one way if the velocity is increased and the other if reduced. In one of the ends is arranged a piston A, which moves freely in the tube. When the mercury rises or falls in the tube the piston does likewise, and, being connected to a section of a spur gear, to which it imparts motion by means of levers and links as shown, it causes the pinion on the axis of the gauge pointer to be rotated in a degree corresponding to the rise and fall of the mercury.

The device is simple and ingenious. In actual trial it has proved to be a delicate indicator of a change in velocity. An ordinary service stop will cause the hand to move almost completely around the dial; the rise and fall of the mercury corresponding thereto is about  $\frac{3}{4}$  of an inch.

Since our engraving was made the indicator somewhat changed in detail has been put on the market by J. H. Reynolds, of Troy. The modifications consist in putting a piston in each end of the tube and connecting these pistons by a lever, pivoted in the middle. By this means the motion of the gearing is made positive, whichever way the mercury is flowing. The tube is inclosed in a box with the dial placed outside.

#### The Senate Committee Hearing on Canadian Competition.

The United States Senate Committee on Inter-state Commerce, which held meetings in New York City a few months ago, met in Boston July 5, and heard the views of numerous railroad officers and others interested in through traffic to the West. They first interrogated President William Bliss, of the Boston & Albany, who said that there was no use trying to drive out the Canadian roads, but that they should be subject to the same regulations as American roads. If the present complications had been foreseen by our forefathers, the American roads would have been protected against Canadian competition by laws in the same way that the American coastwise navigators were. If the Canadian roads continue to be aided by subsidies to maintain transatlantic steamers, Boston will suffer. In spite of subsidies, American roads could, no doubt, compete with them if not handicapped by the American law. Canadian competition diverts business from the Boston & Albany,

but as there is no profit in through Western business Mr. Bliss did not seem to regret this much. Speaking of uniform rates, he thought they should not be changed oftener than twice a year. The Inter-state Commerce law had been of great benefit, and his road would regret to go back to the conditions existing before its enactment. The recent amendments were good, but had not been properly tested. The traffic of the Canadian roads out of Chicago since the passage of the Inter-state Commerce law has doubled. Considering that the Canadian roads are longer, that they have to cross the St. Lawrence River and that their local population is small, the American roads could carry freight more cheaply than they in the long run.

President Choate, of the Old Colony, believed there had been an increase of business on the Canadian roads since the passage of the Inter-state Commerce law, and that the same results would not have followed if the law had not been passed. The large shipments from New England cotton mills to China would have been taken by American roads were they not tied hand and foot by the Inter-state Commerce law. The general feeling in New England was against that law. It had been of no advantage, unless perhaps to stop temporarily the building of railroads. The Canadian roads had been more beneficial to New England than to themselves.

Ex-Governor Smith of the Central Vermont thought that the Grand Trunk was complying with the provisions of the Inter-state Commerce law in every point. The same was true of the Canadian Pacific. He did not believe these roads attempted to recoup on local business for supposed losses on through freight. He believed any legislation looking to non-intercourse, if certain restrictions were not obeyed, would be disastrous to the very roads now asking for it. Whatever amicable settlement could be agreed upon would be much better than legislation. The Canadians had allowed American cars to pass freely in bond over their territory, and Americans were more indebted to them than they were to Americans.

C. S. Mellen, General Traffic Manager of the Union Pacific, said that his road suffered from Canadian competition less than the other through lines. The Canadian Pacific is allowed to quote rates 40 per cent. below those in force on American lines. This is a bad condition of things, but it would be tolerable were it the actual condition; no one believes, however, that the Canadian Pacific maintains even these low rates. During June, 1888, the Canadian Pacific took 10 per cent. of the eastbound business out of San Francisco; the next six months it took 12 per cent., in January of this year 11 per cent.; February, 25; March, 29, and in April, 28 per cent.

On July 6, Mr. Alden Speare, President of the Boston Chamber of Commerce, detailed the history of what has been done during the past few years in Boston to procure release from unfair discrimination. The advent of the Canadian lines made the American lines more accommodating. What Boston wanted was to have the present conditions continued. If Canadian roads could be placed under the regulations of the Inter-state Commerce law, it would be agreeable to New England, but New England was satisfied with present conditions. Speaking of New England's need of low freight rates, Mr. Speare said: New England has 8 per cent. of the population of the United States, grows one-quarter of 1 per cent. of the wheat crop of the United States, and half of 1 per cent. of the corn crop, to feed 8 per cent. of the inhabitants of the United States, not enough to supply the inhabitants of Rhode Island alone; and we have to buy of and bring from the other sections 550,000 tons of grain, 525,000 tons of flour, and we have to pay \$50,000,000 for meat for our own consumption. We grow only 4 per cent. of the wool crop of the country, but consume 50 per cent. of the entire clip and 55 per cent. of all consumed in the country. We grow not a pound of cotton, but consume annually 23 per cent. of the whole crop and 75 per cent. of all consumed in this country. While New England has 31 per cent. of the water power employed in industrial work, we also have 15 per cent. of steam power, and consume 5,250,000 tons of anthracite and 4,000,000

tons of bituminous coal, and we do not produce a pound of either, and of course buy of and transport from other sections. An estimated value of American goods consumed in New England in 1888 was \$310,000,000. New England annually produces more than \$200,000,000 in value of boots and shoes and leather, at least 50 per cent. of the production and consumption of the United States.

President H. B. Goodwin, of the Boston Executive Business Association, said that 40 per cent. of the grain coming to New England in winter comes by Canadian roads. In summer the proportion is larger. The Inter-state Commerce law affects New England adversely. Wm. L. Putnam, of Portland, Me., said the sentiment of that city was solidly against interfering with the present bonded systems on the Grand Trunk and the Canadian Pacific. On Monday, July 8, E. B. Neally, President of the Bangor & Piscataquis Railroad, filed resolutions adopted by the Bangor Board of Trade in favor of giving all facilities to the Canadian Pacific through Maine.

Other witnesses have been: General Manager Furber, of the Boston & Maine; C. C. Coffin, for the Concord Road; the Lowell Board of Trade; the Fall River Board of Trade; Jerome Jones, one of the leading importers of Boston; ex-Gov. Claflin, for Boston merchants; F. F. Emery, for the New England Shoe and Leather Association; Hon. Jonathan A. Lane, President of the Boston Merchants' Association; William G. Barker, for the Boston lumber interest; and S. H. Skilton, for the pork-packers. But one position in substance was taken by all of these witnesses. They are all opposed to any change in the law by which their present advantage of low freights over the Canadian roads may be cut off.

The committee has finished its inquiry at Boston and will meet next in Detroit.

#### THE SCRAP HEAP.

##### Notes.

A jury at Memphis, Tenn., last week decided in favor of the railroad companies the suit of various insurance companies against the Mississippi & Tennessee and the Louisville, New Orleans & Texas roads for \$290,800, being the value of some cotton burned at Senatobia, Miss. The insurance companies alleged that the fire was set by a spark from a locomotive.

A boy of 16 years has been arrested at Weissport, Pa., for train wrecking. He has persistently misplaced switches on the Lehigh Valley road, and three trains were derailed in one week.

Eight persons were killed in a collision in Roehrmoo, Germany, July 7, an express train running through a misplaced switch and into a standing train.

A dispatch from Bucharest, Roumania, July 9, says: "A passenger train collided with a freight train near Cinnita yesterday. Fifteen persons were killed and many injured. The accident was due to the mistake of a switchman."

The Central of New Jersey has filed plans for the erection of a building in New York City for its general offices which will cost \$700,000. The building will be ten stories high, and the three lower stories will be occupied by the company for offices.

The Baltimore & Ohio directors, who, now as in the past, appropriate money for the support of the library for employees at Mount Clare, Baltimore, have notified the employees that for the expense of management and distribution of books each employee will be assessed. "Twenty-five cents per annum it is hoped will be sufficient."

The fast express of the Philadelphia & Reading, which leaves Philadelphia for New York at 7:30 a. m., and whose schedule time for most of the distance is about 50 miles an hour, including stops, arrived in Bound Brook (the end of the Reading road) on time or earlier 121 days out of 130 between Jan. 1 and June 1. The tardiness of the nine other trips aggregated but a few minutes.

A newspaper item is authority for the statement that the agent of the Port Royal & Western Carolina, at Anderson, S. C., recently delivered several car-loads of merchandise to the person claiming to be the consignee, upon the representation that he had the bill of lading in his office. Such was not the case, the bill of lading being in fact attached to a \$6,000 draft lying unpaid in the bank. The agent was held responsible, the claimant, who was his brother-in-law, being found bankrupt.

#### An English Engineer's Aid for Johnstown.

We have received from Thomas Hawksley, F.R.S., London, Past President of the Institution of Civil Engineers, and the designer of the famous Vyrnwy dam for the new water-supply of Liverpool, fifty pounds sterling, as his subscription to the Johnstown Relief Fund. This generous contribution from England's veteran civil engineer, who, by over half a century of labor in "subduing the forces of nature to the service of man," especially in the field of hydraulic engineering, has come to a thorough understanding of the value and possible danger of such structures as that which gave way on the Conemaugh, will be warmly appreciated, not only by the "unfortunates," to use his own words, for whom it is designed, but by his professional brethren throughout America.—*The Engineering and Building Record.*

#### Russian Railroads in Persia.

Herapath's says that the report is confirmed that a convention has been negotiated between Russia and Persia to the effect that the railroads which are to connect the Caspian with the India Ocean shall be constructed exclusively by Russians who have been approved by the Czar's government. The English should have induced the Shah to commence his journey via London instead of via St. Petersburg, then they would not have had a sucked orange.

#### The Governor of Iowa Should Hire a Dragon.

The reader will remember that the palace fire in Pekin was in some way attributed to the malign influence of the China Railway Company. Details of the precise relations of cause and effect have been received. The court astrologists, who are consulted in all important matters, declared that the fiery dragon which personifies the Empire of China, must certainly have had one of his claws crushed on some of the recently constructed railroads, and had consequently belched forth fire upon the Emperor's palace. It was immediately resolved, by royal decree, that in order to prevent the recurrence of a similar calamity, no more railroad concessions would be granted; and that as to the railroads already authorized, they might be operated if the dragon gave no further signs of displeasure.





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#### EDITORIAL ANNOUNCEMENTS.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

The experiment which the Chicago, Milwaukee & St. Paul is trying with a wheel tread designed to fit the rail is of especial interest since the chief engineer of that road called attention so sharply to the desirability of having increased area of contact between the wheel and the rail. Indeed, the wheel tread shown on another page is not now considered by the officers of the road as an experiment, having been used for four or five years with great satisfaction, and being now in use on thousands of wheels. The lines are designed for two obvious purposes—to give greater bearing surface and to obviate cutting out the fillet and sharpening the flange. The greater bearing surface is secured by giving a part of the tread a curve of the same radius as that of the rail head. This does not increase the area of contact so greatly as Mr. Whittemore would expect to do by the use of a flat-topped rail and cylindrical tread, but very likely it does increase it even more than would be done in practice by his device. Compounding the curve of the tread of the wheel into that of the fillet through a curve of comparatively long radius gives a section which serves to keep the flange away from the rail, and has resulted, as we should expect, in greatly diminished destruction of the throat and flange. It is said, in fact, that none of these wheels have been drawn for sharp flanges. We have no information as to the result on the rail of the use of this wheel. Probably none could be obtained, as so many wheels of the usual section are running on the same rail.

Elsewhere in this issue will be found an interesting report of tests of locomotive performance, taken in ordinary service, showing coal and water consumption and horse power developed. In this report the details and methods are in general very clearly explained; and we note but two points which might have been more plainly stated by the experimenter. The remark that "The duration of the test has been taken at the time when the throttle valve was open and the engine was using steam," seems to imply that the total time, from starting to hauling fire, was a different item from the "duration of test;" and if this inference is correct, it might be interesting to compare the results as computed for the whole time in each day's experiment. This would possibly modify the evaporation of the boiler to a material extent. In the dimensions of engine the volume of clearance space is not given, and if the effect of these clearance space upon the consumption of steam as calculated from the diagrams was not considered, the results of the calculation must have been too small. The great difference between actual and calculated consumption of steam points to the possibility of such an omission, because with tight pistons and valves there should be a closer agreement in the case of such an excellent steam distribution as is shown by these diagrams.

The Denver, Texas & Fort Worth has given notice of its withdrawal from the Inter-state Commerce Railway Association. This is not a large railroad, but

some of its directors are large men, which gives the matter great significance. The fact that leading financiers have allowed the withdrawal of one road in which they are interested bodes ill for the future action of other roads of the same character, although the statements of President Dodge and President Adams as to the reasons of the withdrawal and the future relations of the road to the Association are as reassuring as they can be made. It seems unlikely that the Association can hold together in its present shape. The position of the roads which are anxious to withdraw simply is that they are losing business and that they cannot afford to wait for the slow means which the Association may offer for its recovery, especially as such recovery is at best somewhat doubtful. All this emphasizes certain fundamental defects in the original agreement. There was a clause in that agreement which looked to the possibility of pooling in the future, but did not provide for it until necessity should arise. This has proved thoroughly ineffective. A pool is of much more use as a preventive than as a cure. The form of the Inter-state Railway Association agreement did not allow the use of pools in their preventive capacity. The railroads which signed the contract substantially said: "If worse comes to worst we will resort to pools as a remedy." In this way they could accomplish no good. Had they adopted a pool at the outset, they would probably have violated the Inter-state Commerce law, but they would have had something to show for it. Had they said: "We will not violate the Inter-state Commerce law," they would not have accomplished their object, but would have had the benefit of a quiet conscience. As it is, they sacrificed their conscience by agreeing to defy the Inter-state Commerce law under certain contingencies, and sacrificed the object in view by not defying it promptly enough to do any good.

#### New Construction in the First Half of 1889.

The table of new railroad construction for the first half of the year 1889, which is published this week, is strikingly similar in its essential features to that published at the end of the first quarter. We find that the new road built in the United States, Canada and Mexico to July 1, 1889, amounts to 1,644 miles. In 1888 it was 3,050. In the United States alone the new road this year is 1,410 miles, and last year it was 2,980. For the first quarter the figures for the United States were, 1888, 1,000 miles (in round numbers), and in 1889, 474. In the first quarter about 2.11 times as much railroad was built in 1888 as in 1889, and in the half year the ratio was about the same. These figures indicated no falling off for the second quarter, but, on the other hand, they show no gain. The probable errors in the reports are not great enough to change these ratios materially. It is very clear that we are not yet gaining. In April, in considering the new construction of the first quarter, we said that if the ratio were kept up the new mileage of 1889 would be about 3,500 miles, against about 7,000 last year. We see that it has continued practically the same, and that there is nothing in the tables to change the inference drawn then, that the railroad building of 1889 will be less than it has been in any year since 1885. In 1879 the increase of mileage was 4,746 miles. In no year since has it fallen below 6,700 miles, except in 1884, when it was 3,825 miles, and 1885, when it was 3,608 miles. It would be dangerous to predict that in 1889 it will be greater or less than in either of those years.

The amount of road reported under construction is greater than it was three months ago,—about 4,200 miles at the first period, and over 5,000 at the second. The ratio of road under construction in the two years is considerably better than that of road built. That is, while 2.11 times as much railroad was built in the first half of 1888 as in the first half of 1889 there was no more road reported under construction July 1, 1888, than at the same date in 1889. So some of the lost ground may be regained yet. Considering only the market for securities and the condition of general business it seems likely that this will be so. Moreover, in speculation of this kind, it must always be remembered that the existing mileage is now so great that a very moderate percentage added to it in any one year makes a respectable amount of new construction. As we pointed out three months ago, the percentage of new road built each year for the last eleven years has averaged 6.4 per cent., and 6.4 per cent. of the main line road existing at the beginning of 1889, would be about 10,000 miles. On the other hand, the railroad situation offers no more encouragement now to further building than it offered three months ago.

It will be seen that the Southern states maintain

their lead in the proportionate amount of new construction in that territory. At the end of March, 50 per cent. of the new track had been laid in the Southern states east of the Mississippi. Now their proportion is 45 per cent. In the first half of 1888 it was 35 per cent., and for the whole year it was about 31 per cent. The distribution in other groups of states is about as follows: Northern states, east of the Mississippi, 17 per cent.; Southwest, including Kansas and Colorado, 24 per cent.; Northwest, 5 per cent.; Pacific Coast, 7 per cent.

The characteristic feature of this year's building, that it is in short lengths, by many companies, is as marked as ever. The whole new mileage has been built by 103 different companies, giving an average of 16 miles to each. But one company has built over 100 miles; one company in the United States has built 44 miles, but none other has reached 40 miles.

#### Canadian Railroads and New England Business.

It was known that the New England merchants and manufacturers were opposed to the restriction of Canadian transit trade. It was not generally known how widespread and universal was that opposition. The testimony before the United States Senate Committee at Boston indicates how unanimous the feeling is. With slight differences of detail in various quarters, it is shared by railroad men, by traders, and by producers.

To the wheat grower in Minnesota or Dakota the competition of Canadian railroads is at best only an incidental advantage. A few cents difference in railroad charge will make but a slight variation in the price which he receives, while in the volume of his business it makes no appreciable variation whatever. To the New England trader, on the other hand, the matter is one of vital importance. If goods go by Boston the New England man gains everything; if they go by Baltimore, he loses everything. His share in traffic to and from Europe which results from low rates by the Canadian roads is just so much clear gain.

Several different interests participate in this gain. First we have the immediate connections of the Canadian railroads, like the Central Vermont or the Boston & Maine, to which the through business thus obtained is a direct advantage, without a corresponding loss anywhere. These roads are therefore thoroughly in favor of the present state of things and opposed to all change. Any incidental loss which they may suffer from other provisions of the Inter-state Commerce act is more than counterbalanced by the advantage in this respect. In the second place we have the traders and shippers at the northern ports, who handle grain and other products in transit. The further east we go the greater is the advantage from Canadian competition. Boston feels it appreciably; Bangor feels it largely; while the little town of Castine, still further east, sees enormous possibilities from this source looming up in the future. These towns are in favor of the continuance of the Canadian transit trade and against most of the proposed restrictions. There is, however, one point which they would like to see changed. They gain from the low Canadian railroad rates, but suffer from the competition of the port of Montreal, and would like to have the Canadian Pacific compelled to send its transit traffic to Europe by American ports. Castine itself, its representatives say, "has the best harbor on the continent, and it is the desire of the people that it shall be made the shipping port of the Canadian Pacific, since it is only 215 miles further from Europe than Halifax." A third class interested in the maintenance of Canadian Pacific trade consists of the manufacturers who can ship goods westward by that route, and especially those who send their products to China and Japan. These men see that the present system gives them cheaper rates than could be obtained by their competitors further south. They are, therefore, in favor of having the Inter-state law applied where it works adversely to such competitors, who have only American railroads as a means of shipment, but do not wish the same disadvantage extended to apply to their own case.

All these views are natural enough. But there is a fourth class of men who advocate the maintenance of the existing state of things, whose views cause much more surprise. They are best represented by President Bliss, of the Boston & Albany, who expresses himself as being, on the whole, fairly well satisfied with the law as it now is. In theory he advocates the restriction of Canadian traffic, but in practice he admits the difficulties of the case; and he makes so little effort for their solution that it is easy to see that he does not regard the present law as seriously adverse



to the interests of his road. "Aside from the Canadian roads," says President Bliss, "the Inter-state law is a good thing; it has not been a disadvantage to the Boston & Albany. We should dislike very much to go back to the old arrangement. Business is better done and customers better treated. Rates to Boston, New York, Philadelphia and Baltimore have been more equal than before. Personal discrimination has been stopped, as a general thing. The law should not now be changed, but it should be enforced."

The explanation of this is to be found in the sentence with regard to the increased equality of the rates toward different seaports. If the Canadian roads can handle Boston traffic, that very fact is one of the forces acting to make Boston rates come nearer those of Baltimore. This tendency is too strong for railroad associations to prevent. By the relative equality of the ports the Boston & Albany gains as much as it loses by the Canadian competition. While the direct results thus balance themselves, the indirect results on local business due to the stimulus of trade at Boston accrue to the advantage of the Boston & Albany and other Massachusetts roads. This latter fact is clearly brought out in the testimony of President Choate, who, without approving the Inter-state Commerce law, nevertheless most decidedly approves of Canadian competition.

It is impossible to foresee the outcome of all this. It is another illustration of the fact that the questions involved in railroad legislation are not so much conflicts between the public and the railroads, as between one locality and another. The Canadian competition which hurts some interests is found to help New England. If steps are taken to restrict it, New England will complain. While Baltimore, as represented by Mr. Gorman, desires a change, and Chicago, as represented by Mr. Cullom, on the whole favors it, New England, as represented by Mr. Blair, opposes it vigorously. While the Vermont and Massachusetts men desire no change at all, the Maine men wish changes in the regulations about export traffic. The special claim of Castine is a ludicrous bit of exaggeration; but it represents the kind of claim which every section of the country is advancing in favor of legislative protection for its own interest. It is just here that the worst danger of railroad regulation makes itself felt. If railroad legislation takes the form of special legislation in favor of different localities, we return to the old system of favoritism. But the favoritism of Congress is more unwise and probably more irresponsible than that of a traffic manager. Underhand political influence is worse than underhand business influence. While unchecked power by the railroad agents furnishes a chance for corruption and unfairness, regulation by Congress furnishes a certainty of such corruption. There is danger, if railroad legislation is allowed to run on unchecked in its present courses, that it will become degraded to the level of river and harbor bill legislation, and that the most doubtful district will get the lowest rates. A railroad agent may be a bad man to judge of the needs of trade in all parts of the country; but a legislature is still worse, as practical experience has, in too many instances, shown.

#### The Car Accountants' Convention.

There is little to add to our telegraphic report (printed June 28) of the meeting at Mackinaw Island. The gathering was pleasant and profitable, but as on other similar occasions, much of the best talk was in the informal conversations held outside the regular sessions. Except for some examination of blanks and records kept by different roads in conducting the general work of the car service department, checking switching revenue, watching the movement of fast freight and for the supplying of information as to engine, train and car performance, etc., the whole of the time was devoted to the three topics that have recently engaged the Time Convention; per diem, demurrage and a penalty for wrongful diversion. Representatives of roads owning 476,429 cars, more than half the total number in the country, were present, and the decided voice of the meeting was that no one of the three reform measures discussed is sufficient within itself to work much benefit, but that by the introduction of a system embracing all three, viz., a per diem charge to be paid directly by the railroads for the use of cars belonging to other railroads; the collection of demurrage charges from consignees and shippers for the use of cars or track room after a prescribed time, and a penalty charge to be paid direct to the car owner by railroads diverting borrowed cars out of their legitimate routes, car service can be placed on a healthy basis, and that nothing short of this will prove satisfactory.

The car accountant, if a live man, is, by virtue of his position, more thoroughly familiar with all the causes which contribute to car detention than any other officer. The views, therefore, of a convention composed of representatives from roads owning over half the car equipment of the country as to what is necessary to be done to accelerate car movement are now particularly timely, and deserve the attention of managers and all who have the power to either advance or retard reforms. The Time Convention is already committed to the collection of demurrage and per diem charges, the rule providing for the former taking effect Nov. 1 next, and that for the latter on Jan. 1, 1890; but it remains to be seen what action it will take with regard to the penalty charge for car diversion. It is quite possible that the introduction of per diem charges will have a tendency to increase diversion of cars, in that the roads will be inclined to get rid of foreign cars under load via any available route. That a penalty imposed with fairness would further the ends of justice is hardly to be doubted, and the question of adopting a regulation authorizing it should be carefully considered by all who favor per diem charges. It would be a pity to have a hopeful reform neutralized to any extent by the simultaneous increase of a recognized evil. Members of the Car Accountants' Association have placed their organization a step in advance of other societies of subordinate officers by taking measures, on occasion, to get their general managers' indorsement of views looking to innovations, before appearing in the convention to advocate them. We hope they will follow out this idea, and see that between now and the October Time Convention the men who will decide these important questions in that body are fully "loaded" with the data necessary to give them earnest and active notions about them.

#### Railroad Accidents and Railroad Men's Feelings.

On Friday of last week an express train of the Central of New Jersey, running on the New York & Long Branch road, struck a carriage at a grade crossing at Little Silver, N. J., three miles north of Long Branch, and killed its four occupants. It is said that the victims had stopped for a northbound train, and after it passed proceeded to cross the tracks in the face of the southbound. The persons killed were a New York business man and the mother of another, with a child and nurse, and the daily papers have given much attention to the occurrence in their editorial columns.

The distressing nature of such misfortunes as this, as well as the considerations bearing upon the possible remedies for them, have been so many times stated in these columns that we can add nothing enlightening. The Massachusetts Commission report, discussed in the *Railroad Gazette* of March 15 last, constitutes a very full summary of the conditions which surround the problem, and the difficulties to be met, and numerous other utterances will be recalled by readers who are interested. But there is one point in the criticisms of the press that is a little out of the ordinary. The *New York Evening Post*, in saying that the road has the largest passenger traffic in the United States (in the summer), and that therefore it can afford to put watchmen at all its crossings, and that any sharper reproof belongs to the province of the coroner, adds that it would not willingly add to the sufferings of the persons upon whom the responsibility for this bloodshed must fall; whereupon the *New York Tribune* characterizes the humanity of the *Post* as misplaced. Says the *Tribune*: "Railroad officials have not ordinarily been observed to suffer intensely from the bearing of such burdens. They usually carry such responsibility very easily and often very jauntily, being more intent upon excusing than accusing themselves. If individuals engaged in other fields of activity were guilty of the reckless indifference to human suffering and the loss of human lives which is constantly displayed by men engaged in the operation of railroads, the death-rate would exceed the birth-rate, and the country would be depopulated."

We shall not attempt, on the evidence thus far adduced, to decide who was to blame in this case, or to say how poignant the regret of the superintendent or the directors of this road may be now or is habitually known to be in similar cases. We presume that these directors, like most others, give 99 per cent. of their thoughts during waking hours to other financial interests, and that this particular feature of the operation of this particular road thus by force of circumstances has to fight to get itself noticed. We presume that this board of directors, like nearly every other, gives its superintendent at least 48 hours' work to do every day and thus compels him to give

to each subject coming up in his line of duty about one-fifth the time it deserves. The theorem of the *Post* that a road running twenty passenger trains each way daily should have a watchman at all crossings is *prima facie* correct, and we think that the people of the state of New Jersey should see that it is tested; having given a charter to a party of capitalists to construct a railroad for the purpose of making money, they should see that those capitalists do not become careless and leave the road to run itself. Under the conditions just outlined the average railroad stockholder looks merely at the total of the operating expenses (if he looks beyond the dividend at all), and he is as well satisfied with a sum made up of damage bills paid as with one consisting of gatemen's wages. He and his fellows have instructed the superintendent to run the road the same as railroads always have been run because they know of no better way to do it and at the same time save their investment.

But all these considerations put together do not justify the impudence of the *Tribune*. The lines quoted must have been written by some one whose observation has been very limited, or whose judgment is very immature; but being printed in a paper which is claimed, without much contradiction, to be influential in directing public opinion, they deserve notice. As intimated above, we shall not attempt to either condemn or to exculpate the officers of the road in this particular case; but the editor of the *Tribune* applies his statement to railroad managers generally, and it is therefore only fair that those holding his views should put themselves in his (the superintendent's) place. In other words, let the tender-hearted reader try to imagine how he himself would bear the burden if he were to become a railroad superintendent.

Beginning with the drawbacks and restrictions alluded to above, the railroad manager gets the best locomotive engineers he can find, makes the rates for fares and freight as high as the edict of the Legislature, the fear of killing-off business by exorbitant prices and the exigencies of competition will allow, and then finds himself with earnings, say, of one-half what he needs. With this money he must meet a hundred difficult problems of which that of furnishing a gateman at a certain crossing is only one. He decides that the rebuilding of some trestles or the purchase of \$50,000 worth of rails is the most pressing necessity and the crossing has to wait. In a few months some one is killed there. The chances are that the victim is poor or ignorant, or both, and the superintendent must not only be burdened with suspicions that his engineer may have been disobedient and has caused the fatality by running too fast without giving proper warnings, and that possibly he, himself, has failed to fully post himself as to the amount of highway traffic at that crossing, thus deceiving the directors; but he will receive calls from the widow or other bereaved ones involving direct demands on his personal sympathies, not to mention requests for money for funeral expenses for which there is not the slightest legal claim on the company, much less on the superintendent himself. Quite likely the same day will bring the news that a brakeman has been killed on another part of the road, and his widow, in all her anguish, will be in the office before the other has left. Here the superintendent will sympathize, even if he be one of the hard-hearted kind mentioned in the *Tribune*, for the dead man had probably been an acquaintance. These episodes in a superintendent's life are frequent enough to prevent the freezing up of his sympathies from mere thoughtlessness. But the worst hardening influence comes from the same source as those which are expected to have a softening effect. The friends of nineteen-twentieths of the victims of accidents from trains begin a lawsuit against the railroad company and employ a lawyer who generally makes the demand for a much higher sum than he expects to recover; if, then, the railroad company seeks to defend itself, and employs a lawyer who puts the superintendent on the witness stand and gets him to testify to all the points possible in favor of the road, while asking him nothing about those favoring the other side, his utterances are probably taken by the *Tribune* to indicate a "jaunty bearing of the burden" of his personal responsibility.

No reader, however, who has seen anything of these matters will need to be told that the wonder is that railroad men are not hardened even to the degree claimed by their worst critics. The love of money is the root of so many kinds of evil in some claimants' conduct, so many misstatements—not to call them lies—are made concerning the speed of trains, the negligence of engineers to sound the whistle, and the extent of injury suffered, that if a



superintendent does not lose all confidence in human nature he may be deemed a most profound philosopher and one who resolutely looks beyond what he constantly sees before him. If there is apparent indifference in any case it is no doubt the result of the most settled hopelessness, founded on a state of things that may well appal any thoughtful person.

The elaborate report of the Massachusetts commissioners for last year shows that 42 per cent. of the grade crossing accidents were in consequence of the disregard of proper warnings, so that the railroad manager sees that his expensive precautions are largely wasted. Of the other 58 per cent. a large share were in direct disregard of the principle of law that wayfarers are "bound to look and listen" before attempting to cross a track. Howsoever tender a manager's feelings, he is bound, in the long run, to accept the edict of the law. A thousand people demand fast time where one demands a slackening of speed at crossings, else the courts would reverse their decisions and compel the engineer to look out for teams, instead of vice versa. A corporation may, indeed, have no soul; but the law is the expression of public sentiment, which is by no means soulless; and it clearly recognizes the fact that the tendency to take risks, to run into danger, is in many people deep seated and irremediable.

The public has a great responsibility in this matter, and the chief difficulties in the way of a proper remedy are of the same nature as those which beset any undertaking which depends wholly upon public action. The unsolvable questions involved in the problem are clearly set forth in the Massachusetts report before referred to, in its explanation of the reasons for allowing new grade crossings to be created. No doubt the great majority of the public would favor the compulsory abolition of grade crossings, and they would, probably, even be willing to pay the higher freights and fares necessary for the purpose of defraying the expense. In Massachusetts or New Jersey this increase would probably not be over five per cent., though where business is lighter the proportionate addition would be greater. But who can devise an equitable and practical plan for carrying out the reform?

#### Annual Reports.

Chicago, Rock Island & Pacific.—Mileage, April 1, 1889, is as follows:

	Owned.	Leased.	Total.
East of Missouri River (Chicago, Rock Island & Pacific)	1,186	407	1,593
West of Missouri River (Chicago, Kansas & Nebraska)	1,388	276	1,664
Total			3,257

The Chicago, Kansas & Nebraska, though nominally distinct, is practically owned by the main company. The report reviews at length the reasons which existed for its construction, stating that the company sought to accomplish the object of securing a share of the through traffic, first by agreement and then by purchase; but that it was unsuccessful in both attempts, and adopted its present policy as a last resort. The existing mileage of the extension is described in detail as follows:

OWNED.	Miles.
Southwest Line, Elmwood, Kas., to Liberal, Kas.	439
South Line, Herington, Kas., to Pond Creek, I. T.	149
Salina Line, Herington, Kas., to Salina, Kas.	49
Northwest Line, Horton, Kas., to Roswell, Colo.	568
Nelson Line, Fairbury, Neb., to Nelson, Neb.	81
Clay Center Line, McFarland, Kas., to Belleville, Kas.	103
Dodge City Line, Dodge City, Kas., to Bucklin, Kas.	25
LEASES.	
Over Union Pacific Railway, Kansas City, Mo., to North Topeka, Kas.	67
Over Union Pacific Railway, Limon, Colo., to Denver, Colo.	89
Over Denver and Rio Grande Railroad, Denver, Colo., to Pueblo, Colo.	119

The results for the year are as follows:

Lines East of Missouri River:	1888-9.	1887-8.
Earnings, passenger	\$3,367,001	\$3,489,501
"freight	8,440,420	8,801,354
Total, including miscellaneous	12,841,030	13,509,727
Operating expenses	8,709,913	8,386,111
Taxes	417,286	5,555,949
Net earnings	3,713,831	4,767,677

Lines West of Missouri River:

	June, 1887, to March, 1889.
Gross earnings	\$4,721,477
Operating expenses and taxes	4,038,978
Net earnings	682,498
Net earnings entire system	\$4,399,329

The net fixed charges for the period in question were about \$2,800,000, leaving an excess of \$1,600,000; but the dividends of 5½ per cent. for the year were largely in excess of earnings, and left a deficit of about \$1,000,000—apparently a little less than that sum, actually a little more. Had the lines east of the Missouri River done as well in 1888-9 as in 1887-8, it would have just covered the deficiency.

Capital account is as follows:

Capital stock	\$46,156,000
Six per cent. mortgage bonds	12,500,000
Five per cent. extension and collateral bonds	30,230,000
Seven per cent. guaranteed bonds	5,000,000

The main company owns all the bonds of the Chicago, Kansas & Nebraska, and nearly all the stock.

The following are the leading results of traffic operations east of Missouri River:

	1888-9.	1887-8.
Passengers carried	3,705,592	3,720,334
Passenger-miles	146,286,243	142,578,651
Average receipt per passenger mile	cts. 2.206	2.336
Tons carried	5,008,840	4,970,496
Ton miles	874,604,510	941,631,006
Average receipt per ton-mile	cts. 0.97	0.93

With all that is said about adverse legislation, it is somewhat noticeable that the average ton-mile receipt was greater in 1888-9 than in 1887-8. The difference was due to the relative increase in short-haul traffic of a more expensive character.

The necessity for improvement in freight terminal facilities at Chicago has existed for a long time, and the opportunity offering to dispose of the freight house and grounds and the supply store room, all situated east of Clark street and south of 12th street, at a price which was considered by the board of directors advantageous to the company, it was decided by the board to dispose of the property and reinvest the proceeds in property situated west of the tracks, and much more suitable for the purpose. With this end in view the necessary real estate has been purchased during the past two years along the east bank of the Chicago River north of 12th street, and contracts entered into with the city of Chicago; whereby the old wooden viaduct at 12th street (east of the river) has been replaced by a structure of iron and masonry, by the construction of which this company secures the unrestricted use of all that part of 12th street lying underneath the viaduct, and is thereby enabled to completely utilize for freight houses, tracks and team-ways all the land owned between 12th and Taylor streets, and also granting the right to the city to extend 5th avenue by a viaduct to connect with the 12th street viaduct. Under the 5th avenue viaduct the company has built a freight house 648 ft. by 60 ft., of brick, with tin roof. Another freight house, 430 ft. by 40 ft., of brick, with slate roof, has also been erected, situated just east of the viaduct freight house. The entire expense of these improvements will be very nearly met by the proceeds of sale of the property at Clark and 12th streets, and the amount received from the city on the before mentioned contracts.

The English papers do not yet give with any fulness the particulars of the collision on the Great Northern of Ireland on the morning of June 12, the official inquiry having been unfinished and its scope being badly warped, from an American point of view, by the complacency with which Englishmen run cars without hand brakes. The facts, however, are pretty clear. The reports indicate that the train was fitted with the Smith non-automatic vacuum brake, but that on the seven rear cars, which were left standing on the grade with the wheels blocked with cobble stones, there was only one hand brake. The grade was 70 ft. to the mile, and there was no block system, that being in use on only 23 miles out of 518 owned by the company. The point of collision was two miles from Armagh, the excursion being bound for Warren Point, on the shores of Carlingford Lough. The total number killed was 76, of whom the most were young men and women, the children being in the forward cars.

The first questions asked at the investigation were concerning the reasons for not sending two engines, and as to the power of the one engine that became stalled, and the criticisms we have seen dwell chiefly on the duty of the Board of Trade to compel the more prompt adoption of automatic brakes, though they also refer to the poor quality of coal used. But the one plain reason for the runaway was the absence of hand brakes, and in the light of this fact the above questions seem farcical. No doubt the train men who are used to getting along without hand brakes should realize the necessity of using blocks on grades, and it is quite likely that the guard in this case had not a proper sense of his great responsibility; but it remains true that the company is forty years behind the times. This case is a curious illustration of the fact that the British roads have progressed so rapidly in brake reform that they have jumped over one important stage in the process without noticing it. Railroadings were begun with vehicles fitted with few or no brakes (first stage); then came hand brakes on all cars (second stage); then non-automatic power brakes (third), and, finally, automatic power (fourth). After standing still a long time contented with the first stage, some of the English roads have wholly skipped both the intermediate ones. They certainly deserve credit for taking an advanced position at a single bound, especially as they had to combat strong prejudices in order to do it; but it must be conceded that even the best automatic vacuum or compressed air brake should not be depended upon to hold standing cars upon a grade for an indefinite length of time. The absurdity of fitting a long train with powerful brakes and then providing only one place (the engine) from which they can be applied is too apparent to need argument.

At an after dinner speech at Crewe, before the visiting American engineers, Mr. F. W. Webb, Locomotive and Car Superintendent of the London & Northwestern Railway, stated the following: The company has a capital of \$528,000,000, annual revenue, \$51,500,000, and annual expenditure, \$26,500,000. The number of persons employed by the company is 80,000; in locomotive department, 16,000; miles operated, 2,500; stations, 800; signal levers in use, 30,000; lamps lighted every night, 13,500; cabins, 1,400. The number of passengers carried annually is 57,000,000; weight of tickets issued, 50 tons; number of tons of goods and minerals carried, 36,000,000 annually; engine mileage per year, 55,525,334. Last month, with a mileage of 4,750,000, they had with the passenger trains only one hot crank pin, and with the goods trains two such failures, and they had only one failure of a connecting rod for both goods and passenger trains. The number of tons of water consumed was 20,000 per day; coal used, 2,700 tons per day; pounds of water evaporated per pound of coal used, 7.45. During the year, beyond the ordinary services they had run 41,314 special passenger trains, 47,238 special goods trains, 78,285 special

cattle and mineral trains; total, 166,832 trains. The company owns 53,000 freight cars, 5,600 passenger coaches, 3,200 horses, 3,100 carts, 2,500 locomotives and 20 steamships. Crewe engine works occupy 116 acres of ground, the covered area being 36 acres. While it may require an actual personal inspection of these lines and works to obtain a full realization of their dimensions, yet the above general statement and a comparison of it with some of our largest American railroads will show the extent of railroad operation under one management on a little island not much larger than New York state.

The Solicitor of the Treasury at Washington has prepared an elaborate opinion on the subject of assessing duties on Canadian cars entering this country, and the newspapers have given it considerable notice, although it does not appear that it will be approved by the Secretary at present. The opinion emphasizes the fact that the international interchange of cars has been regulated only by custom, the provisions of law bearing upon it being fragmentary and obscure. The Solicitor recommends allowing Canadian cars to come in free, provided the roads guarantee that they will be returned empty. If they are to be used for return loads, those loads should be regarded as American traffic, and, therefore, the cars carrying them should be treated as imported cars, the duty on which, if classed as carriages, would be 35 per cent. ad valorem.

The demand of the Chicago & Alton that roads on which Kansas City is virtually a way station shall allow eastbound traffic to be divided at that point the same as was done when none of the lines running east from there had lines to the West, has been seconded by the Wabash, and the Kansas City papers have taken up the cry with the apparent intention of "booming" their city as a transfer point for everything and everywhere, and they say, in prominent head lines, that "Kansas City Refuses to Become a Whistling Post." There is humor of a good Western kind in the notion of treating busy Kansas City like a lonesome whistling post on the prairie, but somehow the stern facts of experience give a grave undertone to the daily newspaper articles. They sound a little like the whistling of the boy who had a hard time keeping his courage up.

It seems that the bill compelling railroads to equip freight cars with automatic couplers was passed by the late New York legislature, and was approved by the Governor on June 16. It provides that after Nov. 1, 1892, all steam railroads shall equip all of their own engines and freight cars with "such automatic self-couplers," and that it shall be unlawful after that date to run any of their own cars not thus equipped, except in emergencies. In special cases the Railroad Commissioners may extend the time one year. The penalty for non-compliance is \$500 for each offense. In altering the original draft the word "such" was left in the text by inadvertence, and in its present connection has no meaning.

Preparations for the extensive and complicated work of abolishing a large number of highway grade crossings on the lines of the New York Central, Erie and other roads in the city of Buffalo, are progressing favorably, though slowly. The commission representing the city is giving close attention to the arrangements for the work, and detailed plans have already been prepared for under crossings at William street, Fillmore avenue, Oneida, Emslie, Swan, Seneca and Jefferson streets, and over crossings at Louisiana and Michigan streets. The New York Central engineers are actively at work, and it is hoped that all the detailed plans will be completed within a month.

#### NEW PUBLICATIONS.

*The New Omaha Bridge*, a Report to Charles Francis Adams, President of the Union Pacific Railway Co., by George S. Morison, Chief Engineer of the Omaha bridge.

The letter transmitting this report to the President of the Union Pacific is dated Nov. 1, 1888. The report now appears in print. It consists of 28 pages of letter press and 26 lithographic pages 12½ × 17 in. in size, and the whole document is an elaborate and valuable monograph. A brief preliminary narrative is given, which presents some of the history of the old and new bridges. This is followed by a general description of the new bridge, and a more special description of the substructure and superstructure. Tables of cost are given in great detail, together with specifications, records of sinking caissons, tables of time, cost and material and tests of eye-bars. The plates contain a map of the river and the proposed rectification, together with elevations, plans and sections of caissons, piers and superstructure, with several sheets of details.

The new bridge was begun Sept. 22, 1885, and its construction occupied about two years, although the last span was erected May 14, 1887. The old bridge was 2,750 ft. long. The new one is 1,750, comprising 4 through spans of 250 ft. each and 6 deck spans of 125 ft. each. It is a double track railroad bridge with a highway, and has 26 ft. clearance between trusses. The work on the ground was mostly done by the railroad company by day's work, except the masonry, which was done by contract. The foundations were put in by the company's men by day's work, and the superstructure was erected in the same manner. The contractors for the masonry were T. Saulpaugh & Co.; for the superstructure, the Union Bridge Co., and for the earthwork of roadway approaches, Walter A. Smith. The Resident Engineer was George A. Lederle, and the Assistant Engineers, H. W. Parkhurst, Louis Blickensderfer and Ralph Modjeski. The



Chief Inspector of Superstructure was Alfred Noble. The pneumatic machinery was by Clayton and Worthington. The total cost of the bridge was \$888,229. About \$44,000 was netted from sale of material. The cost of the substructure was \$440,816, and of the superstructure \$290,162, including freight charges. The masonry amounted to 10,827 cu. yds., and the concrete 5,416 cu. yds. The cost of the masonry in the five principal piers averaged \$25.30 per cu. ft. The weight of iron and steel in the through spans is 3,894,440 lbs., being an average of about 974,000 lbs. per span. In the deck spans the material amounts to 1,958,336 lbs. The steel, amounting to about 1,570,090 lbs., was furnished by the Pittsburgh Steel Casting Co., Carnegie Brothers & Co., and the Pennsylvania Steel Co., and the work was all manufactured by the Union Bridge Co., at their Buffalo shops. Eighteen full-sized eye-bars were tested to destruction, and the records of these tests are given in this report.

*The Crank: Its Motion and True Value for Transmission of Power in Practical Engineering.* By F. Lenggenger, Ph. D.—New York: D. Van Nostrand Co., 1888. 12 mo., pp. 128.

The mechanical crank will probably continue to fulfill its office and give general satisfaction in spite of all the attempts made by human cranks to dispossess it. The present work illustrates one of these attempts, and the author succeeds in demonstrating to his own satisfaction that the crank of a steam engine only transmits half the power exerted by the piston. As might naturally be expected, he pays his respects to the false scientists who have obscured the subject so much, honoring a number of them by stating their names. He does not feel inclined to blame engine-builders, who simply follow a stupid custom; but he urges them to abandon their present practice, and construct a new engine which he describes, and which recovers the power thrown away by the common crank.

It would hardly be worth while to consider seriously the statements of a writer who is convinced that all experiments on the power delivered by a crank are worthless, because no reliable dynamometer ever has been or can be constructed; who thinks that the piston never moves faster than the centre of the crank-pin, and who ignores the elementary principles of the science which he despises.

*Iron Viaducts for Highways.* By J. A. L. Waddell, Consulting Bridge Engineer, Kansas City, Mo.

This is a pamphlet designed to supplement the author's recent writings on highway bridges and to carry on the work which he has set himself of improving that class of bridge practice. A few words are given to an argument for the employment of experts for this kind of work. Mr. Waddell then takes up certain faults of design of frequent occurrence in highway bridges and considers each one briefly. The points discussed are the unnecessary use of skew spans; incorrect location of pedestals transversely to axis of structure; failing to provide properly for effects of changes of temperature; using short, pin-connected spans; omission of struts just above pedestals in both transverse and longitudinal bracing; employing heavy cast iron sockets for the purpose of fixing the lower ends of columns; using cast iron bed plates; failure to proportion columns for bending due to wind pressure when an incomplete system of sway bracing is used; failure to provide for the horizontal shear in the same case; making beams and girders fish belled from false motives of economy; failing to stiffen the iron hand railings; attaching sway rods in such a manner as to produce a torsional effect upon other members; subjecting rivets to direct tension; making lateral struts too narrow for rigidity; using very shallow iron joists, and employing bent eyes on lateral rods. In a pamphlet of but 12 pages so many topics could not be discussed at much length, and the author has endeavored merely to lay down the governing principles.

The Electrical Articles in *Scribner's Magazine* deserve the attention of railroad men fully as much as did the series of "Railroad Articles," and in one respect they should be of even greater interest, for, while the latter contained much matter that was familiar to most railroad men, the general subject of electricity is one in which there is a great deal that they can learn, notwithstanding the knowledge of telegraphy and kindred facts that they already possess. The first article (by Prof. C. F. Brackett, of Princeton College, in the June number) and the second (by C. L. Buckingham, of the Western Union Telegraph Co., in the July number) are admirable and clear summaries of the elementary principles of electricity and of the various methods of telegraphing now in use. No suspicion that the writers are airy theorists should deter any one from reading their productions, for a very brief examination gives evidence of their practical acquaintance with their subjects. The concise statements of historical facts—dates and names to be remembered in connection with discoveries of important features of familiar machines and processes, etc.—alone give marked value to these articles, while their lucid descriptions of the essentials of the duplex, quadruplex and Wheatstone apparatus, and of the instruments used on the Atlantic cables will serve to make these matters clear to many whose ideas concerning them had been hazy.

The final railroad article will appear in the September number of the magazine.

The American supplement to the *Encyclopædia Britannica*, published by Hubbard Brothers & Co., Philadelphia, contains an extremely good article on railroads in the United States. The writer is Mr. J. P. Meany, whose work on "Poor's Manual" has well fitted him for the task. The article is so condensed in itself that we cannot attempt to give anything like an abstract of its contents. The

facts which it gives are in a general way familiar to most of our readers; it is the arrangement and selection of the topics which make the article so good. It deals with the history of American railroad development in the various sections of the country, giving well-chosen statistics of construction with its proportion to area and population, a brief sketch of railroad legislation which touches upon the salient features of the subject, and a set of tables concerning railroad earnings and expenses, volume of business and rates, equipment, capital and financial results. We have seldom seen an article of the kind which meets its purpose so well. It furnishes exactly what the reader wants in a work of reference as distinct from a book or magazine. The consequence is that the writer has saved space, giving in fifteen pages what might readily have been extended over thirty or forty, without crowding his table or omitting any of the more essential facts or figures. It is a pity that more encyclopædia articles are not arranged on the same model as this one.

#### American and British Iron and Steel Production.

The arrival in this country of Mr. Secretary Jeans' statistical report to the members of the British Iron Trade Association renders it possible to compare the production of the two chief iron making countries for the past year, and also to compare the outputs for the last few years.

The production of pig iron in the two countries for the last ten years has been as below, in gross tons:

	American.	British.	U. S. percentage of joint make.
1879.....	2,741,853	6,009,434	31.3
1880.....	3,835,191	7,721,833	33.2
1881.....	4,114,254	8,377,364	33.1
1882.....	4,623,323	8,493,287	35.3
1883.....	4,585,510	8,490,324	35.1
1884.....	4,007,808	7,527,966	35.2
1885.....	4,044,326	7,250,675	35.8
1886.....	5,683,320	6,780,665	45.3
1887.....	6,417,184	7,441,927	46.3
1888.....	6,489,738	7,898,634	45.1

That is, 1888 was our year of greatest production, though not of our greatest consumption, for in 1887 we imported 1,194,301 tons of iron and steel against 587,470 tons in 1888, so that we apparently consumed half a million more tons in 1887 than in 1888. On the other hand, as the English stock of pig iron on hand was reduced from 2,778,684 tons at the close of 1887 to 2,588,708 tons at the close of last year, their consumption should be increased by 189,976 tons, which should again be increased by a net decrease in exports of iron and steel of 176,044 tons. These two amounts, with the consideration that nearly 125,000 tons were sent to storage in 1887, probably brings their consumption and exportation very near that of their most prosperous year.

The pig iron made in Germany for 1888 was 4,258,471 metric tons, as against 3,954,413 in 1887, while the production in France for the two years was 1,688,976 and 1,567,622 metric tons.

The production of rolled or puddled iron in the United States was 2,153,262 tons in 1888, against 2,311,160 in 1887, and in England the production for the two years was 2,031,473 and 1,701,312 tons, showing an increase of 330,161 tons.

The production of Bessemer steel ingots and rails for the past ten years has been as below:

	Bessemer ingots.		U. S. percentage of joint make.	Bessemer rails.		U. S. percentage of joint make.
	Gross tons.			Gross tons.		
	U. S.	British.		U. S.	British.	
1879.....	829,440	834,511	50	610,682	519,715	54
1880.....	1,074,361	1,044,382	51	852,196	739,910	54
1881.....	1,374,250	1,441,719	48	1,187,770	1,023,740	54
1882.....	1,514,688	1,673,649	47	1,284,067	1,235,785	51
1883.....	1,477,345	1,553,380	49	1,148,709	1,097,174	51
1884.....	1,375,532	1,299,676	51	996,983	784,986	56
1885.....	1,519,430	1,304,127	54	959,471	706,583	58
1886.....	2,280,190	1,570,520	59	1,562,410	730,343	68
1887.....	2,995,033	2,061,403	59	2,049,638	1,021,847	67
1888.....	2,511,161	2,012,794	55	1,365,921	979,085	58

Mr. Jeans gives, as of interest to steel makers, the production of Bessemer steel ingots per converter for 10 years, the maximum was in 1887 23,778 tons per converter; our production per converter for that year, not reckoning the produce of Clapp-Griffith's converters, was 39,926 tons. Our English competitors have never adopted the labor and time-saving devices of A. L. Holley and his successors, and they are nearly as much behind us in the outputs of their rolling mills as in their converter practice. In both cases this is probably due to the fact that the lower wages paid in England do not so imperatively demand labor-saving appliances.

As is known, the difficulty over the Reese patents has so far prevented us from making any basic steel. The total make of basic steel in England and Europe has increased from 40,000 tons in 1880 to 1,544,640 tons in 1888. Of this England has pretty steadily contributed a quarter, Germany making nearly all the rest.

The production of open-hearth steel by the two countries for the past ten years has been as below:

	American.	British.	U. S. percentage of joint make.
1879.....	50,259	175,000	22
1880.....	100,849	251,000	29
1881.....	131,201	338,000	28
1882.....	143,341	436,000	25
1883.....	119,336	455,500	21
1884.....	117,515	475,250	20
1885.....	132,483	583,918	21
1886.....	218,973	691,150	24
1887.....	322,069	981,104	25
1888.....	314,318	1,292,742	19

It will be noticed that the increase of British make for last year lacks less than 3,000 tons of being equal to our entire production. This increase is almost entirely due to the prosperity of the shipbuilding industry, and the increase in their make of puddled iron is ascribed by some of their trade journals to the same cause. Though, as 92 per cent. of the shipping constructed in 1888 was of steel, it looks as if the aid of shipbuilding to the puddled iron trade must have been a collateral one, as, in fact, the prosperity extending through the British iron trade seems collateral to shipbuilding.

The increasing use of steel in shipbuilding is very marked. In 1883 85 per cent. of the shipping launched was of iron, according to Mr. Jeans, and the influence of this increasing use on the production of open-hearth steel was shown by the *American Manufacturer* in an article based on Mr. Daniel Adamson's address before the British Iron and Steel Institute last year, in which it was shown that the percentage of English made open-hearth steel going into shipping increased from 3.5 per cent. in 1879 to 24 per cent. in 1887. About half a ton of steel plates is said to be required for each ton of steel shipping, and on that basis the 837,764 tons of steel shipping launched last year would have required about one-third of the total output, besides what was used for machinery on the ships.

Our shipbuilding industry is not at present in as prosperous a state as that of England, and the development of our open-hearth steel works is not proceeding as rapidly as could be wished. A growing tendency both on the lakes and the sea coast, however, to use steel in the construction of steamers will, if persisted in, materially increase our output, but it will not equal that of England until we again become a shipbuilding people.

Great Britain's exports of tin plates for last year amounted to 391,291 tons, or 6,953,128 boxes, valued at £5,538,310. Of this 5,070,499 boxes came to this country.

For a few years we have made more steel than Great Britain; last year that country made more than we did, and probably will do so this year. It is less likely, however, that she will hold the first place beyond this year. The coming struggle is for the first place in the make of pig iron. As late as 1871 we were making but 20.4 per cent. of the joint make of the two countries. Since that time England has added about a million and a quarter tons to its make. We have added four and three-quarter million to ours.

#### TECHNICAL.

##### Car Notes.

The Erie Car Works are building 200 cars for the Silver Lake Railroad; also a lot of ice cars for the same road. The company is also building some tank cars for the American Chemical Co., and is working on some cars for the Calumet & Hecla mines.

The Baltimore & Ohio on Saturday last made a further reduction in the force at the Mount Clare works, discharging 40 men from the passenger car shops.

Five pretty summer cars were shipped this week by the Wason Manufacturing Co., at Brightwood, Mass., for the Brooklyn, Bath & West End Road. The Wason Co. will be busy during the summer on a contract from the government railroads of Chili. An order will be filled for 200 freight cars and a dozen coaches of different classes. The contract has also been taken to build three passenger cars for the Flint & Pere Marquette Road. The interior of these cars will be finished in mahogany.

##### Bridge Notes.

Girving & Robinson, of Winnipeg, have been awarded the contract for bridging on the Morris Branch of the Northern Pacific & Manitoba.

The Delaware & Hudson Canal Co. will replace 18 wooden bridges on the line of the Adirondack Division with iron bridges, filling in with earth the depressions of 450 and 1,500 ft. in length in the town of Greenfield, near Saratoga, now spanned with wooden trestles.

The Missouri Valley Bridge & Iron Works, of Leavenworth, Kan., has been awarded the contract for building a large iron bridge over the Red River near Texarkana, Tex., for the Texarkana Northern road. The contract price is understood to be \$120,000.

The Court at Chattanooga, Tenn., awarded a contract for building a steel bridge across the Tennessee River at Chattanooga, to cost about \$225,000.

The Commissioners of Hennepin County, Minn., will receive, until July 15, sealed proposals at the office of the County Auditor, 2,910 Sixteenth street, Minneapolis, for the erection of an iron draw, highway bridge, 275 ft. long, across the Minnesota River at Bloomington Ferry.

The County Commissioners of Muskingum County, O., have the plans and specifications for two bridges over the Muskingum River. One of three spans and approach will aggregate 1,500 ft., estimated cost, \$80,000; the other is five miles from Zanesville. It will be a drawbridge, with 75 ft. clear on each side, three spans; the estimated cost is \$50,000.

The Board of Supervisors of Lawrence County, Miss., have awarded the contract for building an iron drawbridge across Pearl River at Monticello to the Columbus Bridge Co., of Columbus, O., for the sum of \$16,240. The bridge will be 250 ft. in length exclusive of approaches.

The Board of Freeholders has awarded the contract for building the Spencer street drawbridge over the Elizabeth River, at Elizabeth, N. J., to the King Iron Bridge Co.

Eleven bids for erecting an iron superstructure over the Tuscarawas River at Clinton, Ohio, were received for a bridge 70 ft. long by 18 ft. clear roadway.

##### Manufacturing and Business.

The Marden Car Brake Co., of Boston, last week took orders for 900 Marden steel brake beams for export, the order being the first the company has received for foreign shipment. During last week it also placed its beams on some cars being built by a southern road and took orders for 200 beams for a New England road.

The Baldwin Locomotive Works, of Philadelphia, recently made a continuous test of one week's run on a Westinghouse compound engine of 65 H. P. The engine was non-condensing, and was supplied from an independent boiler, and was loaded to about 75 H. P. The gross coal fired under the boiler during the week's run averaged 2.4 lbs. per H. P. per



hour. This company already had two of the Westinghouse compound engines in its works and as a result of the test it placed an order for a third engine of 200 H. P.

The Walsh Railjoint Co., of Troy, N. Y., has been organized to manufacture track joints and other railroad supplies. Erastus H. Vaughan, John W. Walsh and Edward F. Murray, all of Troy, N. Y., are the trustees. The capital stock is \$25,000.

The M. C. Bullock Manufacturing Co., of Chicago, writes the Ingersoll-Sergeant Rock Drill Co., of New York, that during a recent call at the company's office, Mr. A. E. Blair, Engineer of the Chicago & Northwestern, at Duck Creek, Wis., gave the following report of drilling with a 3½ in. drill in hard limestone: From May 6 to May 20, inclusive, 10 hours' run each day, with four hours' lost time during a rain storm, they drilled 5,208 holes, each 1 in. in diameter by 7 in. deep. On June 6, with 10 hours' run, including all stops, moving about, etc., they drilled 527 holes, each 1 in. in diameter by 7 in. deep.

Alfred Box & Co., of Philadelphia, report increasing orders for their improved radial and radial gang drills. Among recent shipments are the following: A gang of 5 radial drills to the Union Bridge Co., a duplicate gang to the Hilton Bridge Construction Co., a 5-ton traveling crane to Charles Hillman & Co., of Philadelphia, and a 10-ton jib crane to the Chester Steel Casting Co. The firm is now working on a gang of 8 radial drills for the Lassic Bridge & Iron Co., of Chicago, Ill.; a 10-ton crane for the Deoxidized Metal Co., of Bridgeport, Conn.; another 5-ton traveling crane for Charles Hillman & Co., beside several special machines for various parties.

The Lidgerwood Manufacturing Co., 96 Liberty street, New York, has established a branch house at 34 and 36 W. Monroe street, Chicago, where the company will carry a stock of its latest improved machines.

The Springfield Machine Tool Co., of Springfield, Ohio, has leased the plant formerly occupied by the Hanika Iron Fence Co., its present quarters having grown too small for the company's increasing business.

#### Iron and Steel.

Carnegie, Phipps & Co., Limited, recently commenced the manufacture of pressed wrought iron turnbuckles. At present the firm is prepared to furnish from 1 in. to 1½ in., inclusive. Other sizes will be added as rapidly as possible.

The Tubular Steel Wheel Works, at Bissell, O., are expected to be in active operation about Aug. 1. The roof is being placed on the building and the machinery is now ready to be placed in position. The work, it is expected, will be completed within the next 30 days and finished wheels turned out by Aug. 1.

The Wheatland mill, two miles below Sharon, Pa., which has been changed from a rail to a pipe iron mill at a cost of over \$50,000, has been put in operation. The machinery used is run by hydraulic force. The mill will turn out 30 tons of skelp iron per day when running full.

A shaft for a new Bessemer engine was recently poured at the works of the Pennsylvania Steel Co., at Steelton, Pa., which weighed 45,000 lbs. The mould was 25 ft. long and 29 in. in diameter. The casting was a perfect success. No. 2 blast furnace of the above company, which has been idle for some time undergoing repairs, has again resumed blast. All the stacks of the firm, five in number, are now in successful operation.

The Jenifer Iron Co. has been organized at Anniston, Ala., with a capital stock of \$100,000. The stockholders elected John W. Noble President and George A. Noble Secretary and Treasurer.

Notice was given last week by Austin Corbin that the Reading Iron Works would be put in operation as soon as possible, under the name of the Reading Iron Co., and that business will be resumed in all departments. No member of any labor organization (except such as are purely beneficial or benevolent) will be employed by the company; and no man, so long as he is in its employ, can belong to such organization. Any employee found under the influence of liquor, whether on or off duty, will be discharged.

Thirty-four firms have thus far signed the Amalgamated Association's iron scale. This constitutes half of the mills manufacturing iron that worked under the association rules last year. Several of the smaller steel firms have signed the steel scale, but the larger firms, including Jones & Laughlin, have not yet signed.

The Nashville Furnace Co. has been organized and will operate the works of the Nashville Iron, Steel and Charcoal Co., recently purchased at auction. The incorporators are J. Ellis, H. W. Buttorff, W. M. Pollard, J. H. Moore and J. M. Head.

#### Goodwin's Dump Car.

Mr. John M. Goodwin, of Sharpsville, Pa., inventor of the "Goodwin" dump, heretofore illustrated in the *Railroad Gazette*, has received patent (No. 403,584, of May 21, 1889) for improved valve-lever, designed particularly for use in his dumping-car, but advantageously applicable to any dump having swinging valves extending lengthwise of its cargo-box.

The patent covers, also, improved appliances for raising and "replacing" the valves of the Goodwin dump; and adjustable side-boards, by use of which the car in question becomes available for ditching service, or any work in which loading of a car by hand-shoveling from the side of the road is necessary. The top of the sideboard is not as high, above rail, as the floor of an ordinary "flat" car. With the sideboards in use the car dumps (all its cargo on one side or half on each side) same as when loaded from above, by steam-shovel or from chute.

#### Rails for Chili.

It is stated that the American contractors have placed in Berlin an order for 10,000 tons of rails for the Chilean railroads, and that contracts have been concluded with German makers for nearly all of the rails that will be necessary for the new roads. The price is not given. Naturally, United States makers cannot compete for these orders.

#### To Inventors.

The International Manufacturing Association, 10 Wall street, New York, is a responsible corporation formed to "encourage the inventors of mechanical devices and act as a medium for pushing approved devices." It is prepared to investigate the commercial value of inventions and furnish the capital or facilities for testing and introducing them. The officers are: Edmund C. Stanton, President; John H. Montgomery, Vice-President; Louis M. Howland, Treasurer; Henry K. Gilman, Secretary and General Manager; Benjamin S. Church, Consulting Engineer.

#### Automatic Stamp for Rails.

An automatic stamp for branding rails, to be worked by the machinery of the hot saws, has been put in operation at the Edgar Thomson Works. It is the invention of Mr. Thomas James, Assistant Superintendent at Braddock. The apparatus is said to have worked successfully in a recent trial, and it is believed that it will be put into continuous use.

#### Steel Pipe Fittings.

Pipe fittings of steel are now offered of a character and at a price to make them specially adaptable to the purposes of fitting up steam-heating pipes for use on passenger trains. They are lighter in weight than the cast-iron fittings, and freer from defects. Elbows, tees, return bends and a considerable variety of other fittings of this sort are manufactured by Messrs. Stanley G. Flagg & Co., of Philadelphia, who will send samples for inspection.

#### Brooklyn Bridge.

The trustees of the Brooklyn Bridge are endeavoring to secure property for widening the New York approach. The case came up July 10, in the the Supreme Court Chambers, before Justice O'Brien, and will probably be taken before a referee.

#### THE SCRAP HEAP.

##### Valuation of Missouri Railroads.

The State Board of Valuation has completed its valuation of the railroads of Missouri for 1889. The totals are:

Roadbed and superstructures.....	\$43,032,147
Holding stock.....	8,483,489
Buildings.....	1,025,830
Bridges.....	2,450,000
Telegraphs.....	665,813
Total.....	\$55,657,279

The assessment for 1888 was \$4,386,117 less than this.

There is a reduction in the bridge assessment this year of \$450,000 by reason of a recent decision of the Supreme Court, to the effect that the Kansas City Bridge is part of the superstructure of the Hannibal & St. Joseph Railroad, which has heretofore been assessed as separate bridge property and valued at \$500,000, the court holding that only the highway feature of said bridge is assessable by the state board. The same was fixed at \$50,000, thus accounting for the \$450,000 reduction.

The assessment does not embrace the entire value of railroad property in the state, as machine shops, round-houses and warehouses are assessed locally by county assessors.

##### A Cheap Substitute for the Trainboy.

The London *Times'* Vienna correspondent says: A novel institution, which has not been tried in any country in Europe, is going to be introduced into Austria for the benefit of the traveling public in this country. To-morrow railway lending libraries will be opened at about 40 stations of the Western State Railway. The books are in six languages—English, French, German, Italian, Hungarian and Bohemian; and will be lent at the rate of 2d. or 4d. per week, the volumes to be returned at any station where there is a book-stall. Within the next two months from 150 to 200 such libraries are to be opened on the various lines in Austria. The undertaking has been launched by an English company called the "globois."

##### Losses by Floods.

A severe storm which occurred the night of July 9 did considerable damage in Central New York, Vermont and Pennsylvania. Railroad bridges were destroyed at Fonda and Johnstown, N. Y., on the line of the Fonda, Johnstown & Gloversville, and two small bridges of the New York Central are said to have been destroyed, one near Fonda and one between Fonda and Tribe's Hill. Many small highway bridges were carried away in the same region, and there were several wash-outs. In Pennsylvania, near Greengburg, a number of highway bridges were carried away, and a serious wash-out occurred on the Crabtree branch railroad. A wash-out on the Central Vermont, near Brandon, Vt., caused a wreck of a passenger train.

##### A Meritorious Record.

General Manager J. M. Whitman, of the Chicago & Northwestern, sends us some facts concerning the long service of Mr. John Heath, a locomotive engineer on that road, which constitute a record well nigh unparalleled as regards immunity from accident, if not quite so. The statement regarding the satisfactory nature of Mr. Heath's work during the long period named must be regarded as having a significant connection with the remarkable freedom from mishap. We do not know this engineer, and have no means of judging as to his favorable or unfavorable surroundings; good fortune may, indeed, have had something to do with the result given, but train work, even under the most favorable circumstances, has so many elements of risk in it, especially when we look back 20 years, that no one will grudge Mr. Heath ample credit; and we agree with Mr. Whitman that this record is one that any man should be proud of. The letter says:

Mr. Heath's statement covers his work with the company for a period of 29 years, and is an excellent illustration how figures can accumulate from day to day. He entered the service of the company in June, 1860, as fireman, and was promoted to engineer in July, 1863. He commenced to keep at first only a record of the mileage that he made. From August, 1866, this record was enlarged to a daily journal, showing where he ran each day, the engine and mileage made. From Nov. 15, 1872, a record of the train was kept.

Mr. Heath's service up to July 1, 1889, was as follows:

Mileage as engineer.....	905,117 miles.
Mileage as fireman.....	93,658 miles.

Of this 998,775 miles have been run in passenger service. During this time Mr. Heath has never met with an accident or mishap, and has never so much as had the paint scratched upon his engine. In his 26 years of service as an engineer he has never been reprimanded by any officer of the company, and has been absent from duty for one month only.

##### Flowers of Rhetoric in the Wild West.

The organ of the Brotherhood of Railway Conductors says:

"Nothing can check the onward progress of the B. R. C. The little cloud, no larger than a man's hand, that appeared over Los Angeles less than six months ago, now extends over more than one-half of the Union, and has become a perfect cyclone. Those who scoffed and sneered now tremble before the lowering and portentous front of the grand column as it is advancing with giant strides to the East. Such a movement sweeps over the country like the wild, leaping flames go over the western prairies in the autumn."

##### The Way to Become a Good Railroad Accountant.

The *Station Agent* prints a portrait of Mr. M. M. Kirkman, the well-known Comptroller of the Chicago & Northwestern, and in connection therewith an interview, in which Mr. Kirkman says:

A good double entry bookkeeper was at one time thought to possess every qualification requisite for a good accounting officer. Broken down merchants and bankers were especially sought after, because of their conservatism and reliability. Nothing could be more absurd. To take charge of the accounts of a railroad requires as much preparatory education as it does to make a good watchmaker or a good civil engineer. The time to learn the business, moreover, is when

men are young and elastic. To understand accounts thoroughly men must progress in them as they do in every other business; they must understand their business thoroughly; without this understanding they are simply the creatures of their clerks. The fact is becoming more and more apparent and the association of accounting officers will make it still more so. Men cannot acquire knowledge of railroad accounts superficially or by "cramming."

#### RAILROAD LAW—NOTES OF DECISIONS.

##### Powers, Liabilities and Regulation of Railroads.

In California it is held by the Supreme Court that where land is patented to a railroad company as public land, under a grant providing for its disposal as agricultural land, without any reservation in the grant except a general one of mineral lands, and no reservation in the patent, the patent is a conclusive determination by the government that the land is agricultural; and in an action to recover possession, by one claiming title under the company, against persons claiming under a location of a mining claim on the public domain, the character of the land cannot be brought in question.<sup>1</sup>

In Connecticut the Court of Errors and Appeals decides that the lessee of a railroad under a perpetual lease is the owner of that road, within the meaning of the statute authorizing a railroad company whose road crosses a highway to petition for alteration of the highway.<sup>2</sup>

The Supreme Court of Indiana holds that when the statute in a state where a death is caused by wrongful act gives a right of action to the personal representative, that right may be enforced in another state having a similar statute, in a court having jurisdiction of defendant.<sup>3</sup>

In New York, the Supreme Court holds that an agreement between two railroad companies, conferring on each the right to run its cars over the tracks of the other, each retaining absolute control over its road for all other purposes, confers no interest which can be assigned or leased.<sup>4</sup>

In Georgia an insolvent construction company contracted to build a railroad for a corporation, and received nearly all of the latter's stocks, bonds and assets as security for its outlay. Without beginning the work, the persons in control of the construction company transferred all the stock to the persons managing another railroad already in operation, among whom were the president and many of its directors. The funds of the latter corporation were used in purchasing the stock of the construction company, and in this manner the said stock, and the stock and assets of the projected road, were controlled by the same management as the road then in operation. The latter began at the same point, and ran for nearly the same distance, and in the same general direction, as the projected line, which would be, when completed, a competing line. The Federal Court decides that the evident purpose and effect of the transaction was to violate the state constitution, rendering the purchase of the stock of one corporation by another, and any contract between them tending to lessen competition in their respective businesses or to encourage monopoly, illegal and void. Equity will enjoin the carrying out of such an agreement, and will seize the assets of the insolvent construction company at the instance of persons who have loaned money to its president and sole manager to use in building the road, on the faith of his pledge of a share of the profits derived from the work; the company occupying as to them the relationship of derelict trustees.<sup>5</sup>

In Oregon the Federal Court rules that a court of equity, will not enforce the performance of a contract to construct or repair a railroad.<sup>6</sup>

In Minnesota, the Supreme Court decides that the railroad and warehouse commission of the state has no authority to prescribe rates for transportation by common carriers in another state. It cannot fix the rates for carriage between two points within this state, over a route extending across a neighboring state. Such power is vested exclusively in Congress.<sup>7</sup>

The Supreme Court of Nebraska holds that a railroad cannot absolve itself from the performance of duties imposed upon it by law, or relieve itself from liability for the wrongful acts or omissions of duty of persons operating its road, by transferring its corporate powers to them, or permitting them to operate its road as owners of its capital stock. The original obligation of a railroad company to the public cannot be discharged by a transfer of its franchises to another company, except by legislative enactment consenting to and authorizing such transfer, with an exemption granted to such company relieving it from liability. Legislative consent to the transfer is not alone sufficient; there must be a release from the obligations of the company to the public.<sup>8</sup>

##### Carriage of Goods and Injuries to Property.

In Missouri a property owner on a street along which defendant was to construct a railroad track, under authority of the city, filed its bill for equitable relief, on the ground that its property would be damaged, and that compensation had not been paid as required as a condition precedent by the state constitution, but no application for a temporary injunction was made, and in the mean time the track was laid, and in daily use. The Federal Court rules, on final hearing, that it will not grant an injunction, but leave complainant to its remedy at law.<sup>9</sup>

In Arkansas the Supreme Court decides that although under the Arkansas statutes no remedy is provided whereby the owner may obtain damages for land taken by railroad companies, the latter alone having the right to institute proceedings for assessment of damages, the owner is not without remedy, as equity will, in the absence of laches, enjoin the company from unlawfully using the land until proceedings have been taken to acquire title.<sup>10</sup>

The Court of Appeals of Kentucky holds that as the time mentioned, in an indictment of a railroad for obstructing a highway, as being that when the offense was committed, is immaterial, and each obstruction constitutes a distinct offense, an acquittal on the trial of one indictment is not *ipso facto* a bar to another indictment found at the same time, and charging the same character of offense, but is only a bar to a prosecution for such offenses as were then proven or attempted to be proven.<sup>11</sup>

In Texas a railroad was properly and skillfully constructed along the bank of a stream which supplied plaintiff's mill pond and water power below. The timber of adjacent land belonging to the railroad was cut down and removed for ties, and in consequence the sand of which the surface was composed washed down into the stream and was deposited in the mill pond, clogging plaintiff's water-wheel and diminishing the retaining capacity of the reservoir. The Supreme Court rules that the plaintiff is not entitled to damages.<sup>12</sup>

Under the North Carolina statutes a railroad company may enter on land and lay out the route for its road, and either the company or proprietors may apply by petition to the county court, which shall appoint five freeholders to assess damages to the owner of the land. In an action by the proprietor to set aside a deed of the right of way as induced by fraud, and for damages, the course prescribed by the statute was not followed, but the deed was set aside, and the jury was allowed to ascertain the value of the rights and privileges taken. The Supreme Court holds that as no easement had been acquired no damages could be awarded



therefor; nor could damages be recovered for the act of entry on the premises and constructing and using the road.<sup>13</sup>

In Mississippi, cattle belonging to plaintiff got on the track of a railroad within a few yards of a rapidly moving train, and were run over and killed. The engineer did not see the cattle until they were so close that he could not stop the train in time to save them, though, after he saw them, he did everything that was possible to avoid the collision. The Supreme Court holds the railroad not liable, although the engineer might have seen the cattle near the track for several hundred yards ahead.<sup>14</sup>

The Supreme Court of Texas holds that where fire has been kindled by a locomotive without negligence of the railroad company, whether on land of the company or not, the company is bound to exercise such care to prevent the spread of the fire and resulting damages as a prudent man would deem proper under the circumstances, and failure to exercise such care gives a cause of action for injury resulting.<sup>15</sup>

The Supreme Court of Indiana holds that an injunction will lie to prevent a railroad company from making excavations, laying tracks and placing switches without right over the land of another.<sup>16</sup>

In New York the Supreme Court decides that the statute making it the duty of railroads to fence in their tracks, and maintain cattle-guards, and declaring that unless such fences and cattle-guards are made and maintained in good condition the company and its agents shall be liable for injuries to any stock on the track, does not render a railroad liable for injuries to a brakeman caused by a collision between his train and a horse that had strayed on the track over a place where there should have been a sufficient cattle-guard.<sup>17</sup>

<sup>1</sup> Gale v. Best, 20 Pac. Rep., 550.

<sup>2</sup> Town of Westbrook v. N. Y., N. H. & H. R. Co., 16 Atl. Rep., 724.

<sup>3</sup> C. H. & D. R. Co. v. McMullen, 20 N. E. Rep., 287.

<sup>4</sup> Brooklyn C. R. Co. v. Brooklyn C. R. Co., 3 N. Y. (Supp.), 901.

<sup>5</sup> Langdon v. Branch, 37 Fed. Rep., 449.

<sup>6</sup> Oregonian R. Co. v. Oregon R. & N. Co., 37 Fed. Rep., 733.

<sup>7</sup> State v. C. St. P. M. & O. R. Co., 41 N. W. Rep., 1,017.

<sup>8</sup> Chollette v. O. & R. V. R. Co., 41 N. W. Rep., 1,106.

<sup>9</sup> Osborne v. Mo. Pac. R. Co., 37 Fed. Rep., 839.

<sup>10</sup> Organ v. Memphis & L. R. Co., 11 S. W. Rep., 96.

<sup>11</sup> Chesapeake & O. R. Co. v. Com., 11 S. W. Rep., 86.

<sup>12</sup> T. & S. R. Co. v. Meadows, 11 S. W. Rep., 145.

<sup>13</sup> Allen v. W. & W. R. Co., 9 S. E. Rep., 4.

<sup>14</sup> N. O. & N. E. R. Co. v. Bourgeois, 5 South. Rep., 629.

<sup>15</sup> Mo. Pac. R. Co. v. Platter, 11 S. W. Rep., 169.

<sup>16</sup> Lake Erie & W. R. Co. v. Michener, 20 N. E. Rep., 254.

<sup>17</sup> Donegan v. Erhardt, 3 N. Y. (Supp.), 820.

## General Railroad News.

### MEETINGS AND ANNOUNCEMENTS.

#### Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

*Boston & Providence*, quarterly,  $2\frac{1}{2}$  per cent., payable July 1.

*Canadian Pacific*, semi-annual,  $1\frac{1}{2}$  per cent., payable Aug. 17.

*Central of New Jersey*, quarterly,  $1\frac{1}{2}$  per cent., payable Aug. 1.

*Detroit, Hillsdale & Southwestern*, 2 per cent., payable July 5.

*Milwaukee, Lake Shore & Western*,  $3\frac{1}{2}$  per cent. on the preferred stock, payable Aug. 15.

*Mine Hill & Schuylkill Haven*, 4 per cent., payable July 15.

*Paterson & Hudson*, 4 per cent., payable July 2.

*Paterson & Ramapo*, 4 per cent., payable July 2.

*Pittsfield & North Adams*,  $2\frac{1}{2}$  per cent., payable July 1.

*Portland, Saco & Portsmouth*, 3 per cent., payable July 15.

*St. Louis & San Francisco*, quarterly, 1 per cent. on the preferred stock, payable July 15.

*Ware River*,  $3\frac{1}{2}$  per cent., payable July 3.

*Wheeling & Lake Erie*, quarterly, 1 per cent. on the preferred stock, payable Aug. 15.

#### Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

*Campbell Hall Connecting*, special, New York City, July 17.

*Duluth, South Shore & Atlantic*, annual meeting, July 18.

*Hudson Connecting*, special, 115 Broadway, New York, July 22.

*Marquette, Houghton & Antonagon*, annual meeting, Marquette, Mich., July 18.

*New Brunswick*, annual meeting, St. John, N. B., Aug. 1.

*Ogden & Syracuse*, special meeting, Ogden City, Utah, July 17.

*Oregon Short Line*, special meeting July 17.

*Poughkeepsie & Connecticut*, special meeting, 115 Broadway, New York, July 22.

*Rutland*, annual meeting, Rutland, Vt., July 23.

*Utah & Northern*, special meeting, Ogden City, Utah, July 17.

#### Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *National Association of General Baggage Agents* will hold its next meeting at Detroit, Mich., July 17.

The *New England Roadmasters' Association* will hold its next meeting in Boston, Aug. 21.

The *Roadmasters' Association of America* will hold its seventh annual convention at Denver, Colo., Sept. 10.

The *Master Car and Locomotive Painters' Association* will hold its next annual convention in Chicago Sept. 11.

The *American Association of General Passenger and Ticket Agents* will hold its next semi-annual meeting in Atlanta, Ga., Sept. 17.

The *New England Railroad Club* meets at its rooms in the Boston & Albany passenger station, Boston, on the second Wednesday of each month, except June, July and August.

The next meeting will be held Sept. 11.

The *Western Railway Club* holds regular meetings on the third Tuesday in each month, except June, July and August, at its rooms in the Phenix Building, Jackson street, Chicago, at 2 p. m.

The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, at 7:30 p. m., on the third Thursday in each month.

The *Central Railway Club* meets at the Tift House, Buffalo, the fourth Wednesday of January, March, May, August and October.

The *American Society of Civil Engineers* holds its regular meeting on the first and third Wednesday in each month at the House of the Society, 127 East Twenty-third street, New York.

The *Boston Society of Civil Engineers* holds its regular meetings at its rooms in the Boston & Albany station, Boston, at 7:30 p. m., on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meet-

ings at its hall, No. 67 Washington street, Chicago, at 7:30 p. m., on the first Tuesday in each month.

The *Engineers' Club of St. Louis* holds regular meetings in St. Louis on the first and third Wednesdays in each month.

The *Engineers' Club of Philadelphia* holds regular meetings at the house of the Club, 1,122 Gerard street, Philadelphia.

The *Engineers' Society of Western Pennsylvania* holds regular meetings on the third Tuesday in each month, at 7:30 p. m., at its rooms in the Penn Building, Pittsburgh, Pa.

The *Engineers' Club of Cincinnati* holds its regular meetings at the Club rooms, No. 24 West Fourth street, Cincinnati, at 8 p. m., on the fourth Thursday of each month.

The *Engineers' Club of Kansas City* meets at Kansas City, Mo., on the first Monday in each month.

The *Civil Engineers' Society of St. Paul* meets at St. Paul, Minn., on the first Monday in each month.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.

The *Civil Engineers' Club of Kansas* holds regular meetings on the first Wednesday in each month at Wichita, Kan.

#### Roadmasters' Association of America.

The seventh annual meeting of the Association will be convened at Denver, Colo., for three days' session, at 9 o'clock a. m., Tuesday, Wednesday and Thursday, Sept. 10, 11 and 12, 1889. The committee appointed to prepare a programme of questions for discussion at this meeting have submitted the following:

1st. Standard Track Joints; R. Caffrey, Chairman.

2d. Standard Frogs; P. Nolan, Chairman.

3d. Labor on Track; O. F. Jordan, Chairman.

4th. Automatic Switch Stands and Protection of Facing Points; Robert Black, Chairman.

5th. Track Tools and Implements; S. L. Swinney, Chairman.

6th. Standard Cattle Guards; J. Doyle, Chairman.

#### The Engineers Abroad.

The members of the American engineering societies now in Europe have organized the following joint executive committee:

*Honorary Chairman*—D. J. Whittemore, Past President A. S. C. E.

*Chairman*—Henry R. Towne, President A. S. M. E., Mem. A. S. C. E., M. I. M. E.

*Committee*—O. Chanute, Past President A. S. C. E.; C. J. H. Woodbury, Vice-President A. S. M. E., Mem. A. S. C. E.; Thomas C. Clarke, Mem. A. S. C. E.; Prof. F. R. Hutton, Secretary A. S. M. E., Mem. A. I. M. E.; William H. Wiley, Treasurer A. S. M. E., Mem. A. S. C. E., Mem. A. I. M. E.; A. Dempster, Mem. A. S. C. E.; William Kent, Vice-President A. S. M. E., Mem. A. I. M. E.; James Archbald, Mem. A. S. C. E.; S. W. Baldwin, Manager A. S. M. E.; Clark Fisher, Mem. A. S. C. E.; J. T. Hawkins, Manager A. S. M. E.; Dr. Herbert G. Torrey, Mem. A. I. M. E.; George M. Bond, Manager A. S. M. E., Mem. A. S. C. E.; William Forsyth, Manager A. S. M. E., Mem. A. I. M. E.; Oberlin Smith, Mem. A. S. C. E., Mem. A. S. M. E., Mem. A. I. M. E.; E. V. D'Inville, Mem. A. I. M. E.

*Treasurer*—Alfred E. Hunt, Vice-President A. I. M. E., Mem. A. S. C. E., Mem. I. & S. Inst.

*Honorary Secretary*—C. E. Emery, Mem. A. S. C. E., Mem. A. S. M. E., Mem. A. I. M. E.

*Secretary*—Charles Kirchhoff, Jr., Manager A. I. M. E., Mem. A. S. M. E.

Abbreviations: A. S. C. E. represent the American Society of Civil Engineers; A. S. M. E., American Society of Mechanical Engineers; A. I. M. E., American Institute of Mining Engineers.

#### The Engineering Society of the University of Michigan.

The meeting of June 19 marked the close of the 7th year in the history of the Society, a year in which far greater advancement has been made than ever before. At present the membership is about 120, being distributed as follows: Honorary members, 9; graduate members, 30, the remainder being active members.

The annual of the Society, "The Technic," for 1889, will appear about July 15. It will contain a portrait of Prof. M. E. Cooley, the head of the mechanical engineering department, with a sketch of his life. There will be nine papers, most of them by student members of the Society, one by Prof. C. E. Greene, and two by graduate members prominent in the engineering profession. Another feature will be a large number of notes on engineering subjects gleaned from the practical experience of the members. "The Technic" will contain about 110 pages of reading matter, with numerous illustrations. It is expected to surpass in size and value any publication heretofore issued by the Society. Copies may be obtained by sending the price, 50 cents, to the Corresponding Secretary, Lock Box 46, Ann Arbor, Mich.

#### PERSONAL.

—President John Se tt, of the Colorado Midland, has tendered his resignation, to take effect July 25.

—Mr. B. F. Booker, Assistant Engineer of the Gulf, Colorado & Santa Fe, has resigned his position on account of ill health.

—Mr. E. Berryman has resigned the position of Chief Engineer of the Great Eastern and has accepted a similar position on the Quebec Central.

—The Secretary of the Interior has accepted the resignation of Gen. Joseph E. Johnston, Commissioner of Railroads, which was tendered last March.

—Mr. C. O. Parker, Chief Engineer of the Central of Georgia, has been appointed Assistant General Manager of the Jacksonville, Tampa & Key West.

—Mr. E. V. Mulvihill, Car Accountant of the Louisville, Evansville & St. Louis, has resigned that position to become Car Accountant of the Chesapeake & Ohio.

—Mr. William H. Payne, the inventor of the grip used on the Brooklyn Suspension Bridge cable car, has resigned his position of Consulting Engineer of the bridge.

—Mr. R. L. Ettenger, for several years Chief Draughtsman of the Chesapeake & Ohio, at Richmond, Va., has resigned to accept an important position with the Minnesota Car Works.

—Mr. M. H. Cook, who has retired as Superintendent of Telegraph and Chief Train Dispatcher of the "Big Four" Road, had filled the position faithfully and to his credit for over 20 years.

—Mr. W. R. Thornell, Manager of the Seattle, Lake Shore & Eastern, having resigned, Mr. F. W. D. Holbrook, who has just been appointed Assistant Manager, has been chosen to succeed him as manager.

—Mr. A. Beckert, who has been Master Mechanic of the South & North Division of the Louisville & Nashville at Bir-

mingham, has been appointed General Master Mechanic of the southern lines of the system.

—Mr. W. L. Pierce, Secretary of the Lilgerwood Manufacturing Co. and General Manager of its principal office, 96 Liberty street, New York, sailed for Europe, Saturday, July 6, to be absent about two months.

—The President this week appointed Horace A. Taylor, of Wisconsin, to be Commissioner of Railroads, to succeed Gen. Joseph E. Johnston, who was appointed by President Cleveland, and who resigned last March, although his resignation was only accepted this week.

—Mr. J. J. Flynn, who has been the General Western Agent of the Atchison, Topeka & Santa Fe, in Denver for the last ten years, has resigned that position to accept a similar one with the Missouri Pacific.

—Mr. Walter Katte, Chief Engineer of the New York Central & Hudson River, and Mr. George H. Thomson, Bridge Engineer of the same road, have been elected Members of the (English) Institute of Civil Engineers.

—Mr. J. T. Harmer, who succeeds the late Mr. J. McDowell as Auditor of the Mexican Central, was formerly Assistant General Auditor of the Atchison, Topeka & Santa Fe and more recently Auditor of the Elgin, Joliet & Eastern.

—Mr. Andrew Onderdonk has resigned his position as First Assistant to the Resident Engineer of the Baltimore & Ohio, at Baltimore, to accept the position of Chief Engineer of the Roanoke & Southern, with headquarters at Winston, N. C.

—Mr. Charles F. Meek, who has been General Manager of the Fort Worth & Denver City, has been made Vice-President. The office of General Manager has been abolished, and R. J. Duncan, Superintendent, has been made General Superintendent.

—Mr. Felician Slataper, Chief Engineer of the Northwest system of the Pennsylvania lines west of Pittsburgh, and who has been in the service of the line continuously for over 25 years, has been appointed Consulting Engineer. Mr. Thomas Rodd succeeds him as Chief Engineer.

—Mr. W. S. Morris, who has been Division Master Mechanic of the Wabash at Fort Wayne, Ind., has been appointed Superintendent of Motive Power and Rolling Stock on the Detroit, Lansing & Northern and Chicago & West Michigan roads, succeeding the late George C. Watrous.

—Mr. George W. Stevens, who has been Assistant General Superintendent of the Wabash under the Receiver, has been made Superintendent of the Eastern Division of the road, which position he held under the old Wabash, St. Louis & Pacific. Mr. Stevens' first position on this line was as Train Dispatcher, in 1873.

—Mr. Julius A. Graetz has just resigned the station agency of the Lake Shore & Michigan Southern at Pettisville, Ind., after an honorable service of nearly 35 years. He has been agent at the above place since 1857; in that year he deposited with the company \$5 for each of three switch keys, and has now surrendered the keys, receiving in return for his deposit and interest upon it \$48.35.

—Mr. George H. Watrous, ex-President of the New York, New Haven & Hartford, died suddenly at New Haven, Conn., July 5, aged 50 years. Mr. Watrous was a lawyer by profession, and was counsel of the New York & New Haven, and also of the New Haven, Hartford & Springfield road. He did much to effect the consolidation of the roads in 1872, and he became counsel of the new company. In 1879 Mr. Watrous was elected President, resigning in 1887. He had been a Director since 1865. His interests, other than railroad, were quite large, and he was well known throughout the state.

—Mr. T. J. Nicholl, President of the Natchez, Jackson & Columbus, which is now controlled by the Louisville, New Orleans & Texas, has been appointed General Superintendent of the latter road, the office being a new one. Mr. Nicholl will, for the present, retain his title as President of the Natchez, Jackson & Columbus. He has been with the road since May, 1887, as General Manager, and was previously General Manager of the East & West of Alabama from 1885 to 1887. Mr. Nicholl has also served as Assistant, Principal Assistant, and Chief Engineer on Western roads; as Roadmaster on the Illinois Central, Superintendent of Construction on the Dakota Central, Division Superintendent of the Chicago & Northwestern from October, 1880, to May, 1883, and then as Chief Engineer of the Huron & Southwestern until May, 1885.

#### ELECTIONS AND APPOINTMENTS.

*Baltimore & Ohio*.—John Baron has been appointed Train Master of the First Division, with headquarters at Baltimore.

*Briarfield, Blockton & Birmingham*.—The following directors have been elected: Cary A. Wilson, T. G. Bush, Gaylord B. Clark, F. B. Clark, Lever Clark, T. D. Nettles and A. B. Sheppard. Cary A. Wilson, President, and A. B. Sheppard, Secretary.

*Cairo, Vincennes & Chicago*.—Robert Blee has been chosen General Superintendent, Oscar G. Murray Traffic Manager, Edward Hill Purchasing Agent, and J. J. Fletcher, formerly General Freight and Passenger Agent of the Cairo, Vincennes & Chicago, Assistant General Freight and Passenger Agent, with headquarters at Cairo, Ill.

*Chautauqua*.—At a meeting of the directors in Jamestown, N. Y., this week, President Joseph M. Gazzam, of Philadelphia, resigned, and A. O. Granger, of the same city, was elected to fill the vacancy.

*Chesapeake & Nashville*.—At the annual meeting of the stockholders of the road, held in Covington, Ky., last week, the following directors were elected: I. E. Gates, R. T. Colburn, F. H. Davis, E. H. Farjee, H. M. Hoyt, New York; Eugene Zimmerman, H. E. Huntington and A. Evans, of Cincinnati, and J. J. Turner, of Gallatin, Tenn. The directors will meet in New York soon to elect officers. The old officers will probably be re-elected.

*Chesapeake & Ohio*.—W. J. McKee has been appointed Acting Superintendent of the Cincinnati Division, succeeding I. G. Rawn, promoted. The notice on page 452 gives the impression that Mr. McKee's jurisdiction was over the whole line.

James E. Mulvihill has been appointed Car Accountant of the road, with headquarters in Cincinnati, succeeding R. Peckham, resigned.

*Chicago & Atlantic*.—The following appointments have been made by Receiver Volney T. Malott: G. M. Beach, General Manager; L. G. Cannon, General Agent for Receiver; Erskine C. Murphy, Superintendent; J. D. Kershaw, Auditor; A. S. Crane, General Freight Agent; F. C. Donald, General Passenger Agent; C. Leving, Engineer; J. H. Berry, Master Mechanic. The headquarters of the Master



Mechanic is at Huntington, Ind., and that of all the other officers in Chicago.

C. L. Mayne has been made acting superintendent. T. W. Burrows, General Superintendent, having resigned. T. W. Burrows, General Superintendent, having resigned, he has been succeeded by E. C. Murphy, formerly of the Indianapolis, Peru & Chicago road.

**Cincinnati, Hamilton & Dayton.**—C. C. Waldo has been made Purchasing Agent, with office in Cincinnati, vice George W. Saul, resigned.

**Cleveland, Cincinnati, Chicago & St. Louis.**—E. M. Lawler succeeds W. P. Orland as Master Mechanic of the western end of the Indianapolis & St. Louis division.

**Delaware & North River.**—Charles St. John, Wm. E. Scott, Peter E. Farnam and O. P. Howell, of Fort Jervis, and Edward Lauterbach, Louis Adler, A. J. Hardenburg, L. E. Schoonmaker, Hugo Rothschild, Stephen Pehus, Wm. N. Cohen and Wm. Norris, of New York City, and J. N. Cox, of Ellenville, are named as directors of this road just chartered in New York.

**Detroit, Lansing & Northern.**—W. S. Morris has been appointed Superintendent of Motive Power and Rolling Stock of the Detroit, Lansing & Northern, the Chicago & West Michigan, the Saginaw Valley & St. Louis roads. Mr. Morris succeeds the late George C. Watrous.

**Duluth, South Shore & Atlantic.**—C. B. Hibbard has been appointed General Passenger and Ticket Agent of the company, with headquarters at Marquette, Mich., to succeed S. F. Boyd, who resigned some time ago.

**Evansville & Terre Haute.**—G. W. Howard has been appointed Master of Transportation, with office in Evansville, Ind., to succeed C. R. Barnhart, resigned.

**Fort Worth & Denver City.**—C. F. Meek has been elected Second Vice-President and the office of General Manager has been abolished. J. G. Jones has been elected Treasurer, vice J. T. Granger, resigned. J. T. Granger has been appointed Financial and Transfer Agent. R. J. Duncan has been appointed General Superintendent. The office of Superintendent has been abolished. J. L. A. Thomas has been appointed General Freight and Passenger Agent, vice J. H. Lawder, Acting General Freight Agent, and George Ady, General Passenger Agent, both resigned. The office of Assistant General Freight and Passenger Agent has been abolished. The office of Superintendent of Transportation and Telegraph has been abolished, and reports hitherto made to the Superintendent of Transportation and Telegraph will be sent to the General Superintendent at Fort Worth, Tex.

**Galveston, Harrisburgh & San Antonio.**—The Southern Pacific Co. having surrendered its leases and ceased operating this road and the Texas & New Orleans, they will hereafter be operated by their own officers, as below, the headquarters of all being at Houston, Tex.: J. Kruttschnitt, Vice-President and General Manager; W. G. Van Vleck, General Superintendent; E. G. Blecker, General Freight, Passenger and Claim Agent; John Bagnall, Auditor; J. J. Ryan, General Master Mechanic; E. B. Pickett, Stock Claim Agent; Chas. Scheidemantel, Assistant Stock Claim Agent; R. S. Stephens, Material and Fuel Agent, and P. J. Huder, Paymaster. W. B. Mulvey is Superintendent of the Texas & New Orleans road.

**Greenville & Southeastern.**—The incorporators are: D. G. G. Dunklin, F. C. Smith, J. F. Stallings, W. F. McKenzie, J. G. Daniel, J. F. Thomas, A. A. Ezekiel, J. T. Steiner, all of Greenville, Ala.

**Gulf, Colorado & Santa Fe.**—George Sealey has been elected First Vice-President to fill the vacancy occasioned by the resignation of C. W. Smith. The duties of Manager and Chief Engineer, formerly discharged by A. A. Robinson, devolve upon General Superintendent J. H. Scott, who has headquarters in Galveston. W. F. White, Traffic Manager, has resigned, and the office has been abolished, the duties devolving upon the General Freight Agent.

**Guntersville, Fort Payne & Chattanooga Valley.**—This company, whose incorporation was noted in our issue of March 22, has elected the following directors and officers: President, W. H. Rise; Vice-President, J. M. Spaulding; Treasurer, F. H. Tobey; General Manager, C. O. Godfrey; Directors, Dr. J. M. Ford, Gen. W. Warner, Kansas City, Mo.; H. C. Young, Boston; Col. L. Dobbs, E. C. Parker, Kansas City, Mo.; W. R. Rice, J. N. Spaulding, C. O. Godfrey and F. H. Tobey.

**International Great Northern.**—J. E. Galbraith has been appointed Traffic Manager and will have supervision of the freight and passenger business; with headquarters at Palestine, Tex.

**Jacksonville, Tampa & Key West.**—C. O. Parker has been appointed Assistant General Manager, with headquarters at Jacksonville, Fla., and in the absence of the general manager will be his representative.

**Kansas City & Nebraska.**—The following directors were recently elected: W. P. Dunivant, Newman Erb, A. L. Applewhite, C. A. Jewett, James Reichnecker, and C. F. Brotherton. The officers are: W. P. Dunivant, President; Newman Erb, Vice-President; C. H. Trimble, Secretary; C. F. Brotherton, Assistant Secretary, and E. Summerfield, Treasurer.

**Lockport & Buffalo.**—At the annual meeting held at Lockport, N. Y., this week, the following directors were elected: Thomas T. Flagler, Levi F. Bowen, James Jackson, Jr., J. Carl Jackson, Alonzo J. Mansfield, John Hodge, William Richmond, William Spaulding, Isaac E. Merritt, John T. Darrison, James S. Liddle, Washington H. Ransom, Ambrose S. Beverly.

**Louisville & Nashville.**—A. Beckert, who has been Master Mechanic in Birmingham, Ala., has been appointed General Master Mechanic of the South & North Alabama, Birmingham Mineral, Nashville & Decatur, and Nashville, Florence & Sheffield Divisions, with office at Decatur, Ala. C. B. Gifford, Traveling Engineer of the entire system, has been appointed Master Mechanic of the South & North and Birmingham Mineral Railroads at Birmingham.

Mr. W. W. Pike, Master Mechanic of the shops at Decatur, Ala., has been appointed Master Mechanic of the Louisville division, with office in Louisville.

**Memphis, New Orleans & Texas.**—T. J. Nicholl has been appointed General Superintendent, with headquarters at Memphis, Tenn. He will have charge of the transportation, motive power, car and roadway departments.

**Massachusetts Railroad Commission.**—Everett A. Stevens has been re-appointed Commissioner for three years.

**Mexican Central.**—J. T. Harmer has been appointed General Auditor of the road to succeed A. J. McDowell, who died recently in Mexico.

**Michigan Central.**—After July 1 the Western division will extend to the east bank of the St. Joseph River, and the Eastern division will be extended to include the Detroit & Bay City, east of the Bay City yards, and the Detroit, Saginaw & Bay City east of the East Saginaw yards. Geo. W. Comstock has been appointed Assistant Superintendent and Trainmaster of the Eastern division.

**Missouri Pacific.**—H. J. Flynn has been chosen General Western Agent of the Missouri Pacific, with office in Denver, Col., vice George Cook, resigned.

**New York, Pennsylvania & Ohio.**—H. F. Coyle has been appointed Chief Train Despatcher of the Eastern division, with office in Meadville, Pa., in place of John S. Matson, promoted to Superintendent.

**New York, Providence & Boston.**—This company now operates, under lease, the Providence & Worcester road, designating it, together with the East Providence branch, the Worcester Division, with Charles Howard Superintendent. The duties of the general officers of the New York, Providence & Boston will extend over this division. Albert Griggs has been appointed Master Mechanic of the Worcester Division, with headquarters at Valley Falls, R. I.

**New York & Sea Beach.**—John Van Ness has been appointed Superintendent of Motive Power, with office at Bay Ridge, L. I.

**Northern Colonization.**—The board of directors of this company is now composed of Mayor Grenier, J. D. Rolland, Thomas Brennan, Hon. W. Provost, with A. Desjardins, President.

**Northern Pacific.**—S. R. Ainslie having resigned the position of General Superintendent of this company to accept that of General Manager of the Wisconsin Central Co., reports heretofore made to Mr. Ainslie will for the present be sent to Wm. S. Mellen, General Manager.

Oscar Musing has been appointed General Manager's Secretary, and has been authorized to countersign requests on foreign roads for transportation, and to issue this company's transportation over his countersignature.

**Pennsylvania Lines West of Pittsburgh.**—Felicjan Slataper has been appointed Consulting Engineer of the Northwest System, with office at Pittsburgh. Thomas Rodd has been appointed Chief Engineer of the Northwest System, to succeed Felicjan Slataper, appointed Consulting Engineer. His office will be at Pittsburgh.

**Pitkin County.**—This Colorado company has elected the following officers: H. A. W. Tabor, President; Ira W. Pendleton, Vice-President; L. M. Babcock, Secretary; W. R. Mygatt, Treasurer; C. E. Shriver, Chief Engineer; George G. Merrick, Superintendent of Construction.

**Quebec Central.**—E. Berryman has been appointed Chief Engineer, with office in Sherbrooke, Quebec.

**Rio Grande & El Paso.**—The following officers were elected by the directors, July 3: C. R. Hudson, Vice-President, General Freight and Passenger Agent; H. U. Mudge, General Superintendent; J. W. Zollars, Secretary and Treasurer; A. J. Crone, Auditor, all with office at El Paso, Tex.

**Seattle, Lake Shore & Eastern.**—F. W. D. Holbrook has been appointed Manager of this company, with office in Seattle, Wash. Ter., vice W. R. Thornell, resigned.

**Southern Kansas, of Texas.**—At a meeting of the board of directors held in Fort Worth, Tex., July 3, the following changes of officers were made: J. J. Mullane, Vice-President, in place of C. W. Smith, resigned; J. J. Mullane, Secretary, vice E. Wilder, resigned; E. W. Taylor, Treasurer, at Fort Worth; G. L. Goodwin remains Assistant Treasurer at Topeka; K. E. Wilder was elected Assistant Secretary at Topeka; J. A. Ostrander was elected Auditor at Fort Worth; Hugh R. Irvine was elected General Superintendent and General Freight and Passenger Agent at Fort Worth.

**Southern Pacific.**—Mr. A. C. Hutchinson has retired from the active management of the Atlantic system of this company, and Mr. Julius Kruttschnitt has been appointed General Manager. Mr. Hutchinson will remain President of Morgan's Louisiana & Texas Railroad & Steamship Co., and will exercise general supervisory authority over the interests of the Atlantic System of the Southern Pacific Co.

**Texas & Mexican.**—The annual meeting of the stockholders was held at Laredo, Tex., July 1, and elected the following board of directors: W. G. Raoul, Theo. D. Kline, J. N. Graubath, Wm. Spurgeon, Gabriel Morton and Andrew Morrison, Jr. Officers: W. G. Raoul, President; Theo. D. Kline, Vice-President; Gabriel Morton, Treasurer; Andrew Johnson, Secretary.

**Tuskaloosa Belt.**—Incorporated in Alabama by W. C. Jemison, W. G. Cochran, G. A. Searcy, B. Friedman, Geo. P. Ayres, T. B. Allen and W. C. Fitts.

**Wabash.**—The following appointments have been made: S. B. Knight, First Assistant General Freight Agent, St. Louis, Mo.; J. D. Lund, Second Assistant General Freight Agent, St. Louis, Mo.; Sumner Hopkins, Assistant General Freight Agent, Chicago, Ill.; J. M. Osborn, Division Freight Agent, Toledo, Ohio; R. G. Butler, Division Freight Agent, Detroit, Mich.; E. E. Fleming, Division Freight Agent, Decatur, Ill.; M. B. Williams, Commercial Agent, St. Louis, Mo.

Frank A. Palmer has been appointed Assistant General Passenger Agent of the Consolidated Wabash Railroad, with office at Chicago.

**Western Maryland.**—At a recent meeting of the Western Maryland Tidewater Co. in Baltimore, the following were elected directors: J. M. Hood, C. Devries, J. Edward Hambleton, E. G. Hipsley, W. S. Rayner, John C. Legg and A. P. Burt. The directors elected J. M. Hood, President, and J. S. Harden, Secretary and Treasurer. An agreement has been entered into by the Tidewater Co. and the Western Maryland by which the former will transfer to the latter its entire stock at cost, when the proper time arrives. This arrangement, with the election of the Western Maryland board of directors, places the Tidewater line in control of the former company.

**West Virginia & Kanawha.**—The incorporators of the West Virginia company are: James C. Beach, G. Lee Stout, of Bloomfield, N. J.; H. L. Tracy, W. H. Schofield, A. B. Schofield, of New York City; Charles A. Draper, of Sing Sing, N. Y.; T. L. Brown, of Charleston, W. Va.; and C. W. Henley and S. T. Teays, of St. Albans, W. Va.

#### OLD AND NEW ROADS.

**Albany & Astoria.**—Incorporated in Oregon by James S. Cowen, W. B. Barr and others to build a line from Astoria southeast to Albany, a distance of about 150 miles.

**Aspen Mountain.**—The company has filed in several counties in Colorado copies of a mortgage for \$300,000 made to the Central Trust Co., of New York, to secure a similar amount of six per cent. bonds. The road is to be narrow gauge and to be built from the town of Aspen around

the mountain, around the western point of Aspen Mountain, up Castle Creek to Tourtelotte's Park, and afterwards to Ashcroft. The first 12 miles of the road will be begun within 30 days, and the last eight from the terminus to Ashcroft some time during the summer. Edward E. Frey is President of the company and W. J. Miller, of Greenwood Springs, Secretary and Treasurer.

**Astoria & South Coast.**—The Pacific Construction Co. has agreed to build this road for \$20,000 in first-mortgage bonds and \$10,000 in stock per mile of road built, the bonds and stock to be issued as fast as the line is completed. The Pacific Construction Co. has built many miles of road for the Southern Pacific, and it is thought that that company will operate the Astoria & South Coast when it is completed. The road is projected to extend from Astoria, Or., along the Pacific Coast to Tillamook Bay, and thence to a connection with the Oregon & California at Salem and Albany.

**Atlanta & Western.**—Brown & Lawrence, of Atlanta, Ga., are the contractors for grading the extension from East Point, Ga., to Atlanta, 6 miles, referred to June 28. The extension runs alongside the tracks of the Central of Georgia, over which the company now has trackage rights.

**Baltimore & Potomac.**—The company, on July 6, filed a blanket mortgage to the Safe Deposit & Trust Co., of Baltimore, for \$10,000,000, to cover an issue of bonds to that amount for the payment of all outstanding obligations. The company pledges all its properties of every description as security.

**Bowling Green & Northern.**—The locating survey has now been completed, the estimates have been made and the contract for grading will be let in two weeks. The line is 65 miles long from Litchfield to Scottsville, Ky. M. H. Crump, of Bowling Green, is Secretary.

**Canadian Pacific.**—It is stated that this company will shortly call for tenders for the construction of the branch line from Brandon, Manitoba, to Souris, 100 miles. The company will soon commence rebuilding many of its bridges between Port Arthur and Winnipeg and put the trestle work into better shape.

Track-laying on the London & Detroit extension was commenced last week in three places, at Chatham, at Windsor, and at Appen. The work of grading was much delayed during the month of June by the constant rains, but the line, 112 miles to the Detroit River, will be ready for traffic in October.

**Centralia & Gray's Harbor.**—Erickson & Son have been awarded a contract to build 10 miles of this road from Centralia, W. T., and grading was begun on June 24. Nearly three miles of road has been graded east of Shookumchuck, W. T., and work is being pushed vigorously from Centralia eastward toward the coal fields in that region.

**Central of Georgia.**—Wright & Strother, of Ozark, Ala., have the contract for building 50 miles of the Savannah & Western extension from Eden, Ga., near Savannah, to the Oboe River.

**Central of New Jersey.**—The directors of the road this week declared a dividend of 1½ per cent. on the stock of the company. The dividend is payable out of the earnings for the quarter ended June 30, and it is expected to maintain the rate quarterly hereafter. A dividend has been expected, but it has been postponed from time to time until the company could reach a position which would warrant the permanency of the quarterly rate. It is the first dividend paid to the stockholders in five years, and the first that has been earned in a longer period without any aid such as was given when the Philadelphia & Reading road guaranteed a fixed amount on the stock.

**Chattanooga, Gadsden & Montgomery.**—It is stated that the survey will be commenced immediately for this road, which was recently incorporated in Alabama to build north from Gadsden to the Georgia state line, at some point on the eastern boundary line of Cherokee County. The capital stock is \$500,000.

**Chattanooga Southern.**—The company's forces are now working on a seven-mile section from Rock Creek, Ga., south, which will soon be completed. The locating survey is being made from this point south, toward Anniston, Ala., as fast as possible. The main shops and offices will probably be located at the southern terminal.

**Chicago, Burlington & Quincy.**—The following table gives the earnings and expenses for May and the five months to May 31:

Month of May.	1889.	1888.	Inc. or Dec.
Gross earnings.....	\$2,108,261	\$1,749,187	I. \$359,074
Oper. expenses.....	1,339,843	1,685,512	D. 345,669
Net.....	\$738,418	\$63,675	I. \$674,743
Jan. 1 to May 31.....	\$9,833,570	\$8,022,032	I. \$1,811,538
Gross earnings.....	6,873,678	7,085,202	D. 211,524
Oper. expenses.....	2,979,892	3,098,830	I. \$2,018,063
Net.....	\$3,893,786	\$3,986,372	I. \$92,586
Jan. 1 to May 31.....	\$2,808,896	\$2,067,362	I. \$741,534
Gross earnings.....	2,005,322	1,829,061	I. 176,261
Oper. expenses.....	893,574	828,301	I. 65,273
Net main line.....	2,979,892	938,830	I. 2,041,063
Net all lines.....	\$3,783,466	\$1,177,131	I. \$2,606,335

**Chicago, Kansas & Nebraska.**—Edward McCormick, of Washington, Ia.; J. W. Creech & Co., of Kansas City, Mo.; Bethune & Craney Bros., of St. Joseph, Mo., and W. F. Calahan, are the contractors for grading the extension of this road from the present terminus at Pond Creek, I. T., south to near Kingfisher, a distance of about 60 miles. The surveys are all completed, and grading has been commenced. Bethune & Craney Bros. also have the contract for the bridges on the line.

**Chicago, Rock Island & Pacific.**—Contracts have been let for the extension from its present terminus at Pond Creek, Indian Territory, to Kingfisher, a distance of 65 miles. Grading on the first section was commenced last week.

**Cincinnati, Alabama & Atlantic.**—The company has mortgaged its line for \$7,000,000, and not for \$700,000 as was stated in these columns last week. The mortgage is made to the Mechanics' Savings Bank & Trust Co., of Louisville, Ky.

It is expected that grading will be commenced by Aug. 1. Mattingly & Thompson, of Louisville, Ky., are the principal contractors, and they will let sub-contracts for grading in 15 or 20 days. The terminal points, as at present designed, are Somerset, Ky., and Huntsville, Ala. The line is now located from Tullahoma, Tenn., south to within 15 miles of Huntsville, and one corps is working in the direction of Huntsville, and may reach there by July 20 with the perma-



ment survey. Another corps of engineers is locating northward from Tullahoma in the direction of Somerset, Ky., but only about 10 miles of that part of the line is located. It is claimed that no inconvenience will be had in placing the bonds of the road, as the country through which it passes is rich in minerals, timber, and farm products, with a large population to the mile. The company has secured nearly \$1,000,000 in local aid by counties, towns, and individuals, and it does not regard the line as being in any sense competing to any existing railroad. P. R. Campbell is President and O. H. P. Cornell is Chief Engineer, both with office in Tullahoma.

**Cincinnati, Selma & Mobile.**—The bondholders and stockholders will hold a meeting soon for the purpose of deciding what to do with the road from Marion Junction to Akron, Ala., 53 miles. The line was lately cut out of Selma by the refusal of the East Tennessee, Virginia & Georgia to renew the lease of trackage from Marion Junction into Selma, 18 miles. It is thought probable that it will be decided to build from Marion Junction to Elizabeth, and connect there with the Birmingham, Selma & New Orleans, entering Selma over the tracks of that road.

**Cincinnati, Wabash & Michigan.**—It is stated that the company has secured control of the Canada & St. Louis road, extending from Goshen, Ind., to Sturgis, Mich., 29 miles, the contractors, the J. J. Burns Co., failing last fall soon after the line was completed between these points. The road is in an unsafe condition and is not operated.

**Clarksburg, Weston & Midland.**—The Weston & Elk River road has been merged in this road, which is to be made standard gauge by Dec. 15. The Weston & Elk River is to extend from Weston southwest to Braxton, W. Va., 42 miles. The survey will probably be completed in a few weeks, when the contract will be let for the first 25 miles.

**Columbia & Port Deposit.**—The Pennsylvania has applied for a decree of foreclosure on the mortgage of the road, which extends from Columbia, Pa., to Port Deposit, Md., 40 miles. The mortgage is on \$2,500,000 25-year 7 per cent. bonds, due in 1893.

**Concord.**—It is stated that at a recent conference of the officers of this road and of the Boston & Maine an amicable adjustment of the differences was effected, and that both parties have assented to the passage by the New Hampshire legislature without opposition by the Concord road of the bill which allows a road to be leased by another, even when there is a minority in either company opposed to the lease, provided the holdings of this minority are purchased at a value to be appraised by arbitrators; the withdrawal of the suit in equity of Frank Jones against the directors of the Concord and the Boston, Concord & Montreal; the withdrawal of opposition by the Boston & Maine to the consolidation of the Concord and Boston, Concord & Montreal roads; the withdrawal from the courts of the suits of the Manchester & Lawrence against the Concord, and their amicable settlement by the parties; a traffic arrangement for the transportation of Boston & Maine passenger and freight business over the Concord road between Concord and Manchester on terms favorable to the Concord road, and that the bill for the purchase of the Concord Railroad by Austin Corbin and associates will not be introduced into the legislature.

**Dallas Pacific & Southeastern.**—Grading is now completed from Dallas, Tex., northeast beyond Grapevine, to near Roanoke, Tarrant County. From Roanoke to Rhome, about 10 miles, the survey is not yet quite completed, but grading will probably reach that point during August. This will make nearly 70 miles of the road graded. The survey has been run west to the Brazos River, near Graham, in Young County. The grades do not exceed one per cent., and 60-lb. steel rails are used.

**Delaware & North River.**—Incorporated in New York to build a road 45 miles long from Summitville, Sullivan County, connecting with the Port Jervis, Monticello & New York road, and passing through Ellenville, Nanapanock, Wawarsing, Kerhonkson, Pine Bush, Accord, Kyserville, Stone Bridge, Marlletown, and Hurley, to Kingston. The capital stock is \$500,000.

**Deming, Sierra Madre & Pacific.**—Press dispatches from Deming, N. M., dated July 4, state that a great concourse of people witnessed the laying of the first rails and the driving of five silver spikes of the new road from Deming to Old Mexico, and that Division Superintendent Col. J. C. Tiffany opened the ceremony with a speech, in which he eulogized Major George H. Sesson, the President of the company; after which five ladies drove the silver spikes.

**Farmville & Powhatan.**—Tracklaying is now in progress on this road, and seven miles has been laid from Clover Hill, northwest to Skingquarter, Chesterfield County, Va. From Skingquarter to Powhatan, 56 miles, the grading has been finished some time, and the track is now being laid.

**Fort Worth & Rio Grande.**—The extension from Granbury southwest will be completed to Stephenville by Aug. 15. About 20 miles of grading is finished, and but 5 miles more remains to be done to bring the line to Stephenville. The locating survey is completed to Dublin and Comanche. Tracklaying will soon be begun on the section now graded.

**Geneva, Ithaca & Sayre.**—This road, at present leased by the Lehigh Valley, will be sold at Elmira, Aug. 27, next, at mortgage sale. It is expected that it will be bought in by the Lehigh Valley.

**Georgia, Carolina & Northern.**—Sealed proposals addressed to the Chief Engineer, R. H. Temple, Chester, S. C., will be received until July 27 next, for the graduation, masonry and trestles upon that part of the Georgia, Carolina & Northern lying between Chester and a point about five miles west of Clinton, S. C., about 50 miles. Profiles and specifications can be seen at the Chief Engineer's office, where printed forms of tender may be obtained. Tenders will not be considered unless made strictly in compliance with the printed forms. The company reserves the right to reject any or all bids.

**Greenville & Southeastern.**—This company, which was chartered in Alabama last March, has filed amended articles of incorporation to build a road from Greenville, Butler County, southeast to Elba, Coffee County, about 45 miles.

**Hartford & Connecticut Western.**—The stockholders at a special meeting on July 9 voted to proceed at once to the construction of an extension from the main line at Tariffville to Springfield, Mass., a distance of 18 miles, at an estimated cost of \$400,000. The right of way has been secured for the greater part of the extension and the contract will soon be let.

**Housatonic.**—The company has formally leased the New Haven & Derby road from New Haven to Ansonia and Botsford, on the Housatonic, for 99 years, beginning July 10, for the following consideration: First three years, \$9,400

each year; second three years, \$14,100 a year, and for the rest of the 99 years, \$18,900 each year. This includes the Starin Dock and all dock privileges in New Haven. The road will hereafter be known as the Derby Division of the Housatonic.

**Illinois Central.**—The following is a comparative statement (June, 1889, estimated) of earnings of the road for the half year to June 30:

	1889.	1888.	Inc. or Dec.
Miles.....	2,275	1,953	I. 322
Gross earnings.....	\$6,406,770	\$5,451,504	I. \$955,266
Oper. exps. and taxes..	4,039,570	3,811,405	I. 228,165
Perm. expend.....	100,846	64,789	I. 36,057
Total expen.....	4,140,416	3,876,194	I. 264,222
Net earnings.....	\$2,266,354	\$1,575,400	D. \$690,954

\* Including the earnings and expenses of the Memphis Division, 100 miles, for six months ended June 30, 1889.

The Dubuque & Sioux City reports its gross earnings for the first six months of 1889 and 1888 as follows:

	D. & S. C.	C. F. & M.	Both roads.
Miles.....	524	78	602
June, 1889 (est).....	\$771,180	\$43,082	\$814,262
1888.....	327	768,059	43,172
Increase.....	197	\$3,121	Dec. \$90
			197
			\$3,032

**International & Great Northern.**—The Supreme Court of Texas, at Austin, has decided the receivership cases in favor of Messrs. Bonner & Eddy, who were appointed at Tyler, in Smith County, last February, under a statute of Texas enacted in 1887, by which actions for the appointment of receivers for corporations are required to be brought in the county where the principal office of the corporation is located, and as the principal office of the International & Great Northern is located in Anderson County, District Judge Williams, in an action brought by stockholders and bondholders, appointed John R. Hearne Receiver on April 30. Mr. Hearne received a judgment against Bonner & Eddy for the possession of the road. On appeal from this judgment the Supreme Court held that the statute conferred a mere privilege on the corporation which could be waived and was in no sense mandatory. Judge Williams held that the statute was based on reasons of public policy and was mandatory. Other points were raised, but the question of jurisdiction was the main question in the case.

**Kansas City, Wyandotte & Northwestern.**—At a recent meeting of the stockholders it was voted to increase the capital stock to \$7,500,000, to provide funds for extending and improving the road. The Kansas City, Lawrence & Wichita has been chartered to build an extension from Tonganoxie to Wichita. It is understood that the company has either secured control of or trackage rights over a line from Tonganoxie to Carbondale, at present operated by the Union Pacific.

**Lackawanna & Southwestern.**—Stockholders of the Lackawanna & Southwestern and Rochester, Hornellsville & Lackawanna roads this week ratified the action of the boards of directors, May 24, 1889, in consolidating the two companies. The new company will hereafter be known as the Lackawanna & Southwestern road.

**Louisville & Nashville.**—The contract for building the second track from Edgfield to Edgfield Junction, Tenn., has been let to Foster & Creighton, of Nashville, and the grading has been commenced. The work is to be completed by Dec. 1.

**Louisville Southern.**—On the extension east from Lawrenceburg to Lexington, 24 miles, via Versailles, tracklaying has now been finished from Versailles east to the Elkhorn River, and is in progress west from Versailles toward the Kentucky River. Several miles has been laid east from Lawrenceburg toward the Kentucky River, and the entire extension will probably be completed by Aug. 15.

**Mexican Central.**—The *Two Republics*, which has been investigating the present condition of the Mexican Central Railroad, says that the freight and passenger traffic on the main line and the Guadalajara branch was never better than at present. The branch from Aguascalientes to Tampico, which is now open to San Luis Potosi, will probably be finished by the last of the present year.

The company has lately received some Baldwin consolidation engines and others from the Mason works, and every thing that foresight can do has been done to prepare for the rainy season, though it is not expected that provision has been made against such a flood as that around Leon last year. The *Two Republics* claims that the Central has the best track west of the Missouri, and offers as a proof of the assertion the fact that the schedule time is 26½ miles per hour, including stops.

**Mexican Pacific.**—The locating survey has now been made for this road from La Puerta de Tonalá, northeast, for a distance of about 18 miles. On July 1 a party of engineers commenced surveying into and over the mountains, and toward Tuxtla, one of the proposed terminals. When the line is completed between these points it is proposed to build several extensions. The contract will be let as soon as possible, probably to an American contractor. The company wishes contractors to inspect the line and put in bids for the work. The iron work for the iron pier at La Puerta de Tonalá is being made in San Francisco. There will be quite a number of small bridges, and several others from 100 to 400 ft. long. The Mexican name of the road is the Chiapas & Tuxtla Railroad. John C. Oliphant, Tonalá, state of Chiapas, Mexico, is Chief Engineer.

**Missouri, Kansas & Texas.**—Judge Brewer, of the United States Court for the District of Kansas, has confirmed the purchase of the Kansas City & Pacific road by the receivers of the Missouri, Kansas & Texas, and sanctioned the contract of the latter road with the Kansas City, Ft. Scott & Memphis, whereby the Missouri, Kansas & Texas gains an entrance and terminal facilities to Kansas City.

**Nashville, Chattanooga & St. Louis.**—The road being built by the Warner Iron Co., of Nashville, from Dickson, Tenn., southwest seven miles to the company's furnaces, will be completed in a few days. Davis & Canty, of Nashville, have the contract for grading and J. M. Freeman for the cross-ties. The rails are being laid by the Nashville, Chattanooga & St. Louis, which will operate the line when completed.

The company has been asked to build a three-mile branch from Hermitage Station, on its Lebanon branch, to the town of Hermitage, Davidson County. It is understood that the company has agreed to build the line.

**Niagara Central.**—The Dominion Government last week granted a subsidy of \$3,200 per mile, to enable the projectors of this road to commence work immediately. The subsidy is for the 14 miles between the end of the portion formerly subsidized and the city of Hamilton, Ont. The Canadian Pacific on the completion of this link, is expected to build a line from Toronto to Hamilton, connecting there with the Niagara Central which runs to Suspension Bridge.

**Northern Pacific.**—The approximate gross earnings of the company for June, 1889, are \$1,700,547, and for June, 1888, they were \$1,610,137, an increase of \$90,410.

**Northwest & Florida.**—The work of changing the road from narrow to standard gauge was completed last week, and the new rolling stock is now in use. The line extends from Montgomery, Ala., south to Luverne, 51 miles, and is now controlled by the Alabama Midland, which will use it as its entrance to Montgomery.

**Nova Scotia & Cape Breton.**—Application has been made for an act to incorporate a company to construct and operate a road in the island of Cape Breton, connecting with the present Dominion railroad system now under construction in Cape Breton, from Orangedale to Broad Cove mines, a distance of 28 miles, thence to Margaree, 16 miles, thence to Chetecamp, 13 miles. Also for a line to run from Richmond coal mines, where it joins the present Cape Breton Railroad, to Louisbourg, a distance of 78 miles.

**Oregon Pacific.**—A contract was let recently to J. S. Antonelle and Loring B. Doe, of San Francisco, for the construction of 20 miles of road eastward from Albany, Or. The contract begins 5 miles west of the tunnel, including it and extending 15 miles east of it, which will complete the road almost to the summit, about 60 miles east of Albany. The company already has about 4 miles of road completed at the summit.

**Oregon & Washington Territory.**—The extension of the Walla Walla Division to Wartsburg and Dayton, W. T., is expected to reach the former point by Sept. 15. Wartsburg is 23 miles from Walla Walla, and Dayton is 33 miles. This extension is to be continued to Whetstone Hollow, 12 miles beyond Dayton.

**Pacific Short Line.**—The city of Ogden, Utah, has raised \$300,000 to aid this road in building from Ogden eastward 100 miles, toward the division now building west from Sioux City, Ia. Twenty acres of land near the city for shops, and right of way was also given the company. The \$300,000 is to be paid as follows: Fifty thousand dollars five years after the completion of the first 25 miles of road from Ogden, with interest at 5 per cent. from date of completion, and \$50,000 on the completion of each succeeding 25 miles of road, with interest on each payment at 5 per cent. per annum until the \$300,000 has been paid, each payment maturing one year later than the preceding one. The line is to be fully completed and in operation before July 1, 1892.

About 1,000 men are working on the Nebraska & Western division, and it is expected to complete the line between South Sioux City and Plainview, Neb., 82 miles, before Sept. 1. The company has had much difficulty in obtaining the right of way in Dakota County, but this has now been secured, and work will commence immediately between South Sioux City and Jackson.

**Port Arthur, Duluth & Western.**—Voting will take place at Port Arthur, Ont., this week on the proposed municipal subsidy to this road. The directors recently gave a month's option to a Mr. Flint, of New York, to build the road, but as nothing has since been heard of Mr. Flint, the company states that it will build 50 miles this season if supported by a bonus from the town. The Dominion government has voted \$271,000 toward the construction of the line, which runs from Port Arthur towards Gun Flint Lake, 85 miles.

**Raritan Valley.**—Surveys are being made for this road, which it is proposed to build from a point on the Millstone branch of the Pennsylvania to New Brunswick, crossing the Raritan River, thence down the Raritan Valley to Ford's Corner, to Woodbridge, to Seewaren, and thence to Perth Amboy, and by way of the New York & Long Branch road to the seashore.

**Red Deer Valley.**—This company has made a proposal to the corporation of Calgary, Man., to construct a road from the Red Deer coal fields to that town, if the municipality will grant a yearly subsidy of \$40,000 for five years, in exchange for which the company guarantees to deliver coal in that town at \$4 per ton. The construction of the road depends upon the acceptance of this offer.

**St. Louis & Birmingham.**—The survey has been completed from Florence, Ala., northwest through Lawrence and Wayne counties, in Tennessee, to Clifton, and across the Tennessee River. At Clifton the survey joins that of the Paducah & Tennessee, which runs north to Paducah, Ky. As already stated in these columns McIntire & Concanon were given a contract last March to build 100 miles of the Paducah & Tennessee.

**San Antonio & Aransas Pass.**—Work is to begin this week at Waco, Tex., on the section of the Waco Division, from Waco south to Cameron, 51 miles, to meet the force building north from West Point to Cameron. The town of Waco gives the right of way free from Waco to the south end of Falls County and \$25,000 in cash.

**Savannah, Dublin & Western.**—The road was offered for sale at foreclosure sale at Savannah, July 2, for the second time this year, no bid being made the first time. It was purchased last week by B. A. Denmark for \$35,000, who, it is claimed, represents a syndicate who will complete the road. The Central of Georgia bid \$30,000.

**Savannah & Western.**—The issue of \$5,000,000 consolidated first mortgage five per cent. bonds, which were recently taken by a syndicate of bankers, were offered to investors this week. The announcement gives the following information concerning the road. It was organized July 1, 1888, by the consolidation of the following auxiliary lines and branches of the Central of Georgia: The Columbus & Western the East Alabama, the Eufaula & Clayton, the Columbus & Rome, the Eufaula & East Alabama, the Buena Vista & Ellaville, the Savannah & Columbus and the Savannah & Western. The road now finished and in operation comprises a line from Americus, Ga., via Buena Vista and Columbus to Birmingham, a distance of 219 miles; a branch from Opelika to Roanoke, 37 miles; a branch from Columbus to Greenville, narrow gauge, 50 miles; a line from Eufaula to Ozark, 61 miles; total road completed and in operation, 367 miles. The capital stock is owned by the Central of Georgia, which company guarantees the payment of the bonds now offered, which are a first lien, subject only to the following outstanding bonds: 1st, \$800,000 Columbus & Western bonds, due June, 1911, a prior lien on the road from Opelika to Birmingham; 2d, \$200,000 first mortgage, Columbus & Rome, on the line from Columbus to Greenville. An equal amount of the Savannah & Western bonds is reserved in the hands of the trustee for retiring the above-mentioned outstanding liens at maturity, and a sufficient amount is also reserved to broaden the gauge of the line from Columbus to Greenville. In addition to the foregoing, \$200,000 bonds have been reserved for a proportionate amount of bonds of the Western Railway of Alabama, due October, 1890, covering about 29 miles of road of the Savannah & Western, the above amount having



been paid over to the Western of Alabama by the Savannah & Western Company, and the former company having assumed the payment of principal and interest. The mortgage covers the entire property of the company, including its equipment, terminals, etc. The total issue authorized by the mortgage is limited to \$18,000 per mile of railroad actually constructed, equipped and in operation.

**Seattle & Northern.**—Capt. A. F. Hill is pushing work on this road from Ship Harbor, W. T., eastward toward Spokane Falls, as rapidly as possible. The road will also be built rapidly from Ship Harbor south along the east shore of Puget Sound to Seattle at an early day.

**Seattle & Southern.**—The survey of this road has been changed in part so as to bring the road east of the Northern Pacific from Puyallup to Hannaford Valley, and then down that valley passing through Centralia, W. T. This will not only avoid a 2,000 ft. tunnel, but it will also avoid the heavy descent into the Newaukum Valley, which grade would have been so heavy as to overcome all advantage in shortening the line.

**Ship Island, Ripley & Kentucky.**—This road, which extends from Middleton, Tenn., to Ripley, Miss., 25 miles, is to be sold at Ripley, July 23, at foreclosure sale of the first mortgage seven per cent. bonds, due 1902, which amount to \$250,000.

**Silverton.**—The construction of the Eureka branch from Silverton to Eureka, Col., eight miles, was commenced this week. The heaviest grade on this line is  $2\frac{1}{2}$  per cent. and the sharpest curve is 20 deg. The surveys for the line from Ironton to Ouray, Col., 12 miles, are not yet completed. The grading on these lines will be done by the company this year. Moses Liverman is Superintendent and C. W. Gibbs is Chief Engineer, both at Silverton.

**South Brunswick Terminal.**—McDermid & Ross, of Toronto, who have the contract for building the line from Waynesville to South Brunswick, Ga., 16 miles, have a large force on the grading, which is progressing rapidly. A cargo of rails has left New York for Brunswick, Ga., and others will soon follow.

**Southern Pacific.**—The extension from Monterey to Pacific Grove, Cal., is being pushed rapidly; trains now run through beyond El Carmelo.

**Tacoma & Silver Beach.**—W. W. Blair, T. W. Loomis and others have filed a charter for this company to build a road from Tacoma southwest to Steelacoom, Wash. Ter.

**Tennessee Midland.**—The road is now finished to the Tennessee River, and through passenger trains from Memphis were put on July 1.

**Texarkana & Northern.**—B. Whittaker and Grigsby Bros., of Jefferson, Tex., have been given the contract for building the first 17 miles north of the Red River. When this section is completed there will be nearly 30 miles constructed from Texarkana. The contract for the bridge across the Red River at this place has also been let.

**Toledo, Findlay & Springfield.**—Incorporated in Ohio with a capital stock of \$1,000,000 to build a road from Springfield north to Toledo.

**Tuskaloosa Belt.**—This company has filed a charter in Alabama to build a road from a point near the depot of the Alabama Great Southern, in Tuskaloosa, thence northerly through the city of Tuskaloosa, and northeasterly through the northern portion of Tuskaloosa County to a point between the counties of Jefferson and Tuskaloosa.

The company has been chartered in Alabama to build a local line at Tuskaloosa. The capital stock is \$200,000.

**Wabash.**—The road east of the Mississippi River is to be divided into two divisions, and the portion between Toledo and East St. Louis and Hannibal will be in charge of George W. Stevens as Superintendent. The portion lying between Chicago and Alton and Chicago and Detroit, will be in charge of J. S. Goodrich as Superintendent.

**Wadley & Mount Vernon.**—Chartered in Georgia to build a road from Wadley south to Mount Vernon, Montgomery County, on the Altamaha River. The distance is about 50 miles, and the capital stock is placed at \$200,000. It will be an extension of the Louisville & Wadley road.

**Washington & Idaho.**—This extension of the Oregon Railway & Navigation Co.'s road is being rapidly pushed through the mountains to Missoula, and to a connection with the St. Paul, Minneapolis & Manitoba and the Union Pacific systems. The road will be completed to Spokane Falls in 90 days, when that city will have a new route east via Pendleton, Oregon. The time will be several hours shorter than by the Northern Pacific to Omaha, but longer to Chicago and the East. On completion of the Washington & Idaho line work will be crowded on the eastern division of the Seattle, Lake Shore & Eastern.

**West Virginia & Kanawha.**—This company has been organized in West Virginia, with a capital stock of \$200,000, to build a railroad in Kanawha County to reach various coal mines.

**Winnipeg & Southwestern.**—Egan Brothers are said to have secured a contract on this road, and it is claimed that work will soon commence at Winnipeg and continue to the Lake of the Woods, connecting there with the line of the Duluth, Rainy Lake & Northwestern, upon which surveys have been recommended.

## TRAFFIC AND EARNINGS.

### Traffic Notes.

Nelson Morris and the American Live Stock Transportation Co. have entered a case in the United States District Court at Utica, N. Y., against the Delaware, Lackawanna & Western, for discrimination in refusing to haul the petitioners' palace stock cars.

The Georgia Pacific is building large coal chutes at Greenville, Miss., and proposes to deliver good coal to the Mississippi River boats there at \$1.50 a ton. The company is building several barges for shipping coal to points between Greenville and New Orleans.

Vice-President H. J. Hayden, of the New York Central, has been chosen Chairman pro tem of the Executive Committee of the Trunk Line Association. C. W. Bullen will be Acting Commissioner of the Freight Department until a successor to Mr. Fink is chosen.

L. F. Webb & Co., of Dalton City, Ill., have sued the Peoria, Decatur & Evansville for \$10,000, for alleged discrimination in freight rates. It is claimed that the vice-president of the railroad company is interested in the milling business, and that his firm is favored with rates lower than those granted Webb & Co.

The Baltimore & Ohio, which resumed the sale of one-way party tickets for ten or more persons at reduced rates about

three weeks ago, has withdrawn them again, the order being suspended because it had been issued in violation of the Trunk Line agreement. The question will now come before the Trunk Line committee.

There having been much strife concerning reduced passenger rates for the Grand Army of the Republic for the coming meeting at Milwaukee, the Cincinnati, Wabash & Michigan has made a rate of \$3 from Indianapolis to Milwaukee and return, the route being by rail to Benton Harbor, Mich., and thence by steamer. The time is about 22 hours, and the rate is less than one cent a mile.

A referee has just reported to the Supreme Court of Ohio in one of the old cases of George Rice, the Marietta oil refiner, against the railroads for discrimination in charging him much higher rates than those accorded the Camden Consolidation Oil Co. and others. The report is, in substance, that the roads—the Cincinnati, Washington & Baltimore and the Cincinnati, New Orleans & Texas Pacific—did discriminate as alleged, and that they are likely to have their franchises forfeited.

The Secretary of Agriculture has issued a circular of instructions which will be sent to the railroads, calling attention to the Act of Congress of May 29, looking to the suppression of contagious diseases among domestic animals. It gives the boundaries within which Texas fever is now prevalent, and notifies the railroads that no cattle are to be transported beyond the limits of said district except in accordance with the regulations specified, which provide for separate feeding and watering places for such cattle, compliance with the sanitary regulations in states where cattle are unloaded, the cleaning out and thorough disinfection of cars used to transport such cattle at regular periods, etc. Inspectors will be shortly named and located at the proper points to see that the provisions of the circular are strictly carried out.

The Executive Board of the Inter-state Commerce Railway Association, in considering a demand that rates on alcohol from St. Paul, Minn. to St. Joseph, Mo., be made the same as on the same commodity from Peoria, says that the present rate on both lines, and in fact throughout the whole territory interested, having been the subject of a general agreement, the present demand must not be considered by itself. All the differentials included in the general agreement must be taken into consideration. An exception like that now demanded should be made only in extreme cases. Alcohol is manufactured both at St. Paul and Peoria. The fact that the cost of manufacture is the same at both places does not alone justify the same rates. Distance and general rate adjustments must be considered. The Chicago, St. Paul & Kansas City, which made the demand, is allowed to make a reduction of 3 cents (from 43 cents to 40), to bring the rate on a level with that from Chicago, but the demand that it be made 35 cents, the rate for Peoria, is refused.

### The Inter-state Commerce Railway Association.

The meeting of the Inter-state Commerce Railway Association at Chicago on Tuesday was attended by representatives of 26 roads, the only members of the Association not being represented being the Chicago & Alton and the Denver & Rio Grande Western. The proceedings were very harmonious. A resolution was passed to the effect that questions requiring arbitration shall be referred to Chairman Walker alone instead of to a board of three. The composition of the Executive Board was changed, and hereafter it will consist of Chairmen Walker, Faithorn, Abbott, Midgley and Finley. President G. M. Dodge, of the Denver, Texas & Fort Worth, which has given notice of withdrawal from the Association, said:

"When we entered this Association it was generally understood that all our Southern connections would be in it, but we went in before they joined. Now, the facts are that we have no business except with one road in this Association. Three-fourths, you may say nine-tenths, of our business is with roads outside of this Association, and it is impossible for me to attend these meetings and comply with the rules when all these lines in the South are out of it, and as they never come in we thought the proper and best way for us was to withdraw. We have not gone out with the intention of making any difference in the rates."

A committee was appointed to consult with the officials of the Alton and endeavor to induce them to consider their withdrawal. Another committee will labor with the Chicago, Burlington & Northern to bring about a restoration of northwestern rates, if possible. On the second day, Wednesday, there was a general discussion of northwestern rates, but nothing definite was accomplished.

### Southwestern Rates.

All divisions of the Western Freight Association met in Chicago on Wednesday and discussed the notice of the Chicago, St. Paul & Kansas City of its intention to apply proportionately the St. Paul low commodity tariff to Missouri River and intermediate points. The matter was turned over to the Board of Managers of the Inter-state Commerce Railway Association. The Board, in anticipation of the action, had appointed a committee to confer with President Stickney and General Manager Egan, of the Chicago, St. Paul & Kansas City, and the Board of Managers will probably act on the subject at once.

The Union Pacific last week reduced its passenger fares from Denver to Chicago to \$26, this being the rate made by the Chicago & Alton from Chicago to Denver. The company was thereupon fined by Chairman Finley of the Trans-Missouri Association for making the reduction contrary to the rules of the association. The Chicago & Alton was fined for its action in the matter \$200, it being a second offense, but dispatches state that the officers of the company state they will refuse to pay the fine. The Chicago & Alton has given notice of a reduction in cattle rates from Kansas City to Chicago from 27 $\frac{1}{2}$ ¢ to 22¢, and this reduction was met on Wednesday by the Chicago, Milwaukee & St. Paul.

Chairman Finley has authorized all the roads in the Trans-Missouri Association to reduce the rate on grain 2 $\frac{1}{2}$  cents per 100 lbs. from points in Kansas to Chicago. The price of wheat is so low that it could not profitably be moved at the old rates.

### Eastbound Grain Rates.

On July 3 the Baltimore & Ohio announced that on July 6 it would reduce rates on wheat and corn from Chicago to Baltimore to 17 cents, and to Philadelphia in proportion, being a reduction of 5 cents per 100 lbs. The road has tried for some time to get the trunk lines to vote this reduction by all lines, but has been unsuccessful. The Pennsylvania has announced that it will meet the reduction of the Baltimore & Ohio, and reduce to New York also, but the officers of the other roads, most of whom were interviewed by the newspapers, opposed any reduction, and seemed inclined to allow the Baltimore & Ohio to continue its reduced rates alone, believing that the traffic affected by it will be chiefly that from the more southern points, while during navigation the more northerly lines have a large traffic from the lake boats. The Grand Trunk, however, announces that if the Pennsylvania makes the reduction, it will take the same action in rates to all New England points, and on all grain products as well as on wheat and corn.

The Joint Executive Committee of the Trunk lines and

their Western connections met in New York on Wednesday, but took no definite action and adjourned to Thursday. The discussion was mainly confined to the grain rate reduction, and the best method of preventing the extension of reductions and the largest possible restoration of rates already ordered to be reduced. There is a general disposition to protect the New York and New England traffic from the effect of promiscuous competition with the Baltimore & Ohio and the Pennsylvania on business to Philadelphia and Baltimore, but the best method of so doing could not be agreed upon. Simultaneously with the news of this meeting comes the announcement that the Chicago & Atlantic has reduced the rate on grain to New York [only] to 20 cents, and that the New York, Chicago & St. Louis has made a similar reduction to all Eastern points.

### Emigrant Traffic.

Commissioner Fink has given his decision in the controversy over the immigrant clearing-house at New York between the Delaware, Lackawanna & Western and the other trunk lines. He holds that the Lackawanna is bound under the Presidents' agreement to become a party to the clearing-house and to surrender its outside methods of gaining traffic. He declares that the steamship contract of the New York, Ontario & Western, which has been the obstacle to the entrance of the Lackawanna, can be taken care of under the rules of the Association.

### Dividends.

The following tables of dividends paid in the nine years 1880-1888 and the first six months of 1889 have been compiled by the Commercial and Financial Chronicle:

NORTHWESTERN.										
Company.	'80.	'81.	'82.	'83.	'84.	'85.	'86.	'87.	'88.	'89, 6mo.
Chicago & Northw'n.	6	6	7	7	7	6	6	6	6	3
Do. pref.	7	7	7	8	8	7	7	7	7	3
Chic., Milw. & St. P.	7	7	7	7	7	4	5	5	2	1
Do. pref.	7	7	7	7	7	7	7	7	7	2
Chic., Burl. & Quincy	9	8	8	8	8	8	8	8	5	2
Chic., Rock Isl. & Pac.	8	7	7	7	7	7	7	7	6	2
Chic., St. P., M. & O. pref.	7	7	7	7	7	4	6	6	6	1
St. P., M. & Manitoba.	3	3	3	3	3	7	6	6	6	3

+ And 20 per cent. in stock. † And 100 per cent. in stock. \* Amount for year diminished by change of dividend periods from quarterly to semi-annual.

SOUTHWESTERN.										
Company.	'80.	'81.	'82.	'83.	'84.	'85.	'86.	'87.	'88.	'89, 6mo.
Chicago & Alton	6	8	8	8	10	8	8	8	8	4
Do. pref.	7	8	8	8	8	8	8	8	8	4
Illinois Central	6	7	7	8	10	8	7	7	7	2
Missouri Pacific	1	6	6	7	7	7	7	7	5	2
Athl., Top. & San. Fe.	8	2	6	6	6	6	6	6	5	1
St. Louis & S. Fr. pf.	4	7	7	7	7	7	7	7	7	3
Do. 1st pref.	7	7	7	7	7	7	7	7	7	3

\* And 17 in stock. † Increase due to change of dividend periods. ‡ And 50 per cent. in stock.

PACIFIC.										
Company.	'80.	'81.	'82.	'83.	'84.	'85.	'86.	'87.	'88.	'89, 6mo.
Central Pacific	6	6	6	6	3	...	...	...	2	1
Oreg. Railway & Nav.	7	8	8	10	6	4	7	6	6	3
Union Pacific	6	6	7	7	3	...	...	...	...	...

+ And 10 scrip. § Owing to change in dividend period the total paid in the year was only as here given.

COAL ROADS.										
Company.	'80.	'81.	'82.	'83.	'84.	'85.	'86.	'87.	'88.	'89, 6mo.
Delaware, Lack. & W.	1	6	8	8	8	7	7	7	7	2
Delaware & Hudson	4	7	7	7	7	6	5	5	5	2
Lehigh Valley	4	5	6	8	6	6	4	4	5	2
Lehigh Coal & Nav.	2	4	5	6	6	5	4	4	4	2

SOUTHERN.										
Company.	'80.	'81.	'82.	'83.	'84.	'85.	'86.	'87.	'88.	'89, 6mo.
Cent. of Ga.	6	8	8	7	5	4	6	8	8	4
Chc., N. O. & Tex. Pac.	...	...	...	...	...	...	...	...	...	...
E. T. Va. & Ga. 1st pf.	...	...	...	...	...	...	...	...	...	...
Louisville & Nash.	8	6	3	...	...	...	...	...	...	...
Nash., Chat. & St. L.	2	3	1	2	...	...	...	...	...	...
Norfolk & West., pref.	...	...	...	...	...	...	...	...	...	...
Rich. & W. Pt., pref.	...	...	...	...	...	...	...	...	...	...
Richmond & Danville	5	7	...	...	...	...	...	...	...	...
Wilm., Col. & Augusta	...	...	...	...	...	...	...	...	...	...
Wilmington & Weldon	3	3	6	6	8	8	8	8	8	4

\* And 100 per cent. in stock. † Out of 1883 earnings.

TRUNK LINES.										
Company.	'80.	'81.	'82.	'83.	'84.	'85.	'86.	'87.	'88.	'89, 6mo.
N. Y. Central	8	8	8	8	7	3	4	4	4	2
N. Y., L. E. & W., pf.	...	...	...	...	...	...	...	...	...	...
Pennsylvania	7	8	9	8	7	5	5	5	5	2
Balt. & Ohio	9	10	10	10	10	10	8	4	4	3
L. Shore & Mich. Sp.	8	10	8	8	7	...	...	...	...	...
Michigan Cent.	8	6	...	...	...	...	...	...	...	...
Canada Southern	...	...	...	...	...	...	...	...	...	...
Cleve., Col. & Ind.	2	5	...	...	...	...	...	...	...	...

† Increase due to change of dividend period.

NEW ENGLAND.										
Company.	'80.	'81.	'82.	'83.	'84.	'85.	'86.	'87.	'88.	'89, 6mo.
Boston & Albany	8	8	8	8	8	8	8	8	8	4
Boston & Lowell	4	4	4	4	5	6	6	6	7	3
Boston & Maine	7	8	8	8	8	8	9	10	9	4
Boston & Providence	8	8	8	8	8	8	8	10	10	5
Fitchburg	6	7	6	6	5	5	5	5	5	2
Maine Central	...	...	...	...	...	...	...	...	...	...
N. Y., N. H. & Hartf.	10	10	10	10	10	10	10	10	10	5
N. Y., Prov. & Boston	8	8	8	8	8	8	8	8	10	5
Old Colony	6	6	6	7	7	7	7	7	7	3
Rutland, pref.	1	2	...	...	...	...	...	...	...	...

\* And 10 in stock.

† And 8 $\frac{1}{2}$  in stock.

‡ Old stock exchanged into new preferred, with 89 $\frac{1}{2}$  per cent. stock dividend; and 2 per cent. paid on this preferred stock in November, 1887, after 3 per cent. on old common in January, 1887, and 2 per cent. in May, 1887.

§ This is amount paid on new preferred stock.

\* Also an extra dividend of 32 per cent. out of amount received from the Old Colony under the provisions of the lease.

The Chronicle cautions its readers against taking the apparent rate of the first half year as in all cases indicating the actual annual rate.